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LECTURES BY M. DE BLAINVILLE ON COMPARATIVE OSTEOLOGY.

THE

## COMPARATIVE OSTEOGRAPHY

OF THE

## *SKELETON AND DENTAR SYSTEM*

IN THE FIVE CLASSES OF

## VERTEBRAL ANIMALS,

RECENT AND FOSSIL.

BY M. H. M. DUCROTAY DE BLAINVILLE,
Member of the Institute of France.

WITH GRAPHIC DELINEATIONS BY M. WERNER;

EDITED (FROM THE FRENCH) AND

ADDITIONALLY ILLUSTRATED

WITH NUMEROUS NOTES, OBSERVATIONS,

AND DRAWINGS,

BY ROBERT KNOX, M.D.,

*Edinburgh; Corresponding Member of the French Academy of Medicine, &c. &c.*

## OSTEOGRAPHY OF THE PRIMATES.

(*Continued.*)

### *Sapajous* (*Cebus*)—*Cebidæ* (*Swain*)—*American Monkeys.**

THE Primates, which form the subject of this our second fasciculus, are those which were designated for the first time under the denomination collectively of Sapajous, by Buffon, and for which we have admitted the Latin name of Cebus (using *Sapajou* more as a generic term), given to them by Erxleben, although thus borrowing from the ancients, who certainly were unacquainted with a single species of the family; the group, in other respects, resembles the preceding Simiæ (*Simiadæ*), very readily characterised, however, by the more terminal disposition of the nostrils, and being more widely separated; by the thumb being never really opposable; and, lastly, by the number of the molar teeth, which are either five or six on each side of each jaw; there are always three *anterior* molars, instead of two, an arrangement which is constant in the Simiæ (*Simiadæ*), or Apes and Monkeys of the Old World.

This distinctive character of the *Cebidæ* would alone suffice to show in their organization an evident degradation, although this degradation in structure is not, after all, very great; but we shall now proceed to prove this by an examination of their osteography and odontography.

#### OF THE BONES OF THE SKELETON.

The Cebidæ being animals even still more arboreal than the Simiæ (*Simiadæ*), it is easy to imagine that they seldom attain more than a median height, and that their skeleton, as a whole, is generally more suited for seizing and clinging to objects, such as the branches of trees.

The bones, however, which compose their skeleton, do not appear to be more solid, more resisting, than those of the Simiadæ, or African Monkeys. It appears to me, however, that the epiphyses of the bones unite at

* It is rather a singular circumstance, that American Monkeys are scarce in Britain, at least we have found it so in the Modern Athens (Edinburgh), where, with the exception of one or two skeletons in our own private museum, we were unable to meet with any skeletons of these animals. A living specimen of the Atèles had got into the possession of the Edinburgh Zoological Garden lately, and, like by far the greater proportion of these animals, it died (poisoned, we think, in consequence of being fed on any thing but its proper food!); and, although the members of the Zoological Society lay strong claims to a love of science and scientific investigation, the dead Atèles was permitted to putrify, and, ultimately, completely disappear, without any examination whatever being made of any part of its anatomy. This will, no doubt, appear strange to our readers, and we have only to add, that we have offered our services to the Directors, and stated our anxious desire to promote the cause of science, with our time and talents, whenever an opportunity offered, arising from the frequent death of specimens in all such collections.—*R. Knox.*

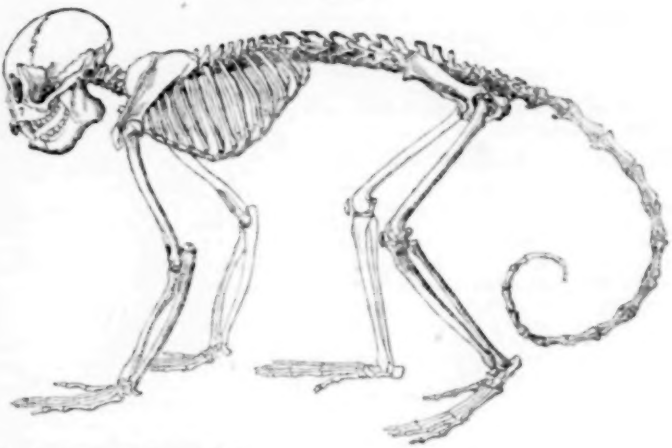
an earlier period, and the processes, ridges for muscular insertion, the grooves, and, in short, every thing which indicates long-sustained muscular action, is generally more developed.

The bones composing the skeleton are, perhaps, more numerous also, than in the other primates, more especially because the tail is always very long, often prehensile, and seeing that there are more vertebræ in a given length of tail.

With regard to the general, and, at the same time, minute arrangement of the bones, the skeleton resembles, almost in every respect, that of the Simiadæ, if it is not, perhaps, that the power of assuming the erect (vertical) position is still more diminished, as also that of the sitting posture, the quadruped form being clearly more marked, as we shall now proceed to show.

For this purpose, and pursuing the plan which we have already adopted in our osteography of the Simiadæ, we proceed to select, for a type of comparison, the skeleton of a species about the middle of the series, viz., the Sapajou or Sajou (*Cebus Apella*), and we shall compare with it the species in the ascending and descending scale.

Fig. 37.



Sapajou Brun. (*Cebus Apella.*)
Sapajou, *Sajou*, *Cebus Apella*, Desm.
Simia Apella, Linn.
*Habitat*, French Guayna and Terra Firma, but not from the Brazils.
The skeleton viewed in profile. Completely adult, after an artificial skeleton in the old collection, and in which, from inattention, no doubt, the atlas has been reversed in its position, that is, turned upside down, and which circumstance I had not noticed until the drawing was finished.

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The entire vertebral column, including the head, is composed of fifty-five vertebræ, four cephalic, seven cervical, fourteen dorsal, five lumbar, three sacral, and twenty-two coccygeal, so that it never presents that truncated appearance which we have remarked in some species of the Simiadæ. The neck, at its thoracic extremity, or root, is considerably curved upward, so as to elevate itself, and present to the head a point of support, at its free extremity. The spinal column presents, for nearly its whole length, a gentle curve, excepting just at the root of the pelvis, and especially in the tail, which is both rolled and twisted spirally, and, finally, the column is pointed both anteriorly and posteriorly.

The cephalic vertebræ of the Sapajou (*C. Apella*), which we have selected for our type, are arranged in rather a different manner from the Guenons, which we also took as a type of the Simiæ or African Monkey; so that the arch, at the point of union of the frontal vertebra, with that of the nasal (second with the first), is much more marked, and recals strongly the similarity to the human species; and as the cephalic (*maxillary*) appendages are, at the same time, very short, falling rapidly from the root of the nose, and seeing that the cranium is more expanded as a whole, and especially the anterior part, the facial angle becomes, consequently, much greater. It is also necessary to observe that the condyles of the occipital bone, being a

little more anterior, the occiput is evidently more projecting posteriorly, and which gives to the cerebral case a greater extent, and a more oval shape, being at the same time more extended at the sides. Each cephalic vertebra, in particular, offers, in other respects, but slight differences, in the corresponding vertebræ in the Callitriche (P. Sabœus), only the frontal, properly so called, pushes itself, generally, at a very early period, between the parietal, and the occipital crest even, is less developed; the sagittal crest (parietal crests) is seldom, if ever, developed, the temporal fossæ are always considerably removed from each other, and the frontal crests scarcely developed, even in the aged male specimen.

The most differential points presented by the interior or cranial cavity of the Sapajou (C. Apella), appears to be in the swelling out of the orbitar vaults, thus diminishing the frontal excavation, and narrowing the cribriform plate of the ethmoid bone; the approximation of the optic foramina, and the sphenoidal fissures; the absence of the anterior clinoid processes; lastly, by a vestige or trace of a cerebellar lamina (*osseous tentorium cerebelli*), by the prolongation of the solid angle of the rocky part of the temporal bone externally.

The cephalic appendages or jaws present differences of greater importance, and, consequently, the cavities or fossæ, which they form, or contribute to form; *first*, because they are evidently much shorter, as we have already stated, the length of the palate not exceeding the half of the whole basilar length, and, afterwards, by other peculiarities sufficiently evident.

With regard to the upper jaw, the posterior palatine root (*internal pterygoid*) is large and high, so as to nearly touch the rocky part of the temporal, and form, with the external pterygoid process (similarly shaped) but still of larger dimensions, a large and deep pterygoid fossa. The lachrymal root of the upper jaw, always completely orbitar, presents a well marked semi-groove, leading to a straight, compressed canal (nasal), half composed of the lachrymal and half of the maxillary bone. The jugal (*malar*) root of the upper jaw, narrow in its orbitar margin, or without the marginal ridge, is pierced with a malar foramen, of moderate dimensions, but much larger than in any of the Simiadæ; the maxillary, which leaves in the orbit, between it and the posterior sphenoid, a fissure and a large foramen posteriorly, is very short, and presents on its margin six alveoli, and anteriorly, one or two suborbitar foramina; and the premaxillary (incisive) as in the Callitriche (*P. Sabæus*), surrounds entirely the nasal orifice; but the ascending (*nasal*) portion is less sloped, and of less dimensions, in its horizontal portion than in the Callitriche. The incisive foramina are oval, and of much smaller dimensions.

In respect to the nasal cavities, they are shorter than in the Guenons; but a little more dilated perhaps, particularly at their orifices. The nasal lateral masses of the ethmoid bone are small, and form a small superior turbinated bone, in the form of a simple longitudinal plate, curved slightly below; next, a middle turbinated bone, with four laminæ, two directed superiorly, and two inferiorly, which three grooves separate from each other; lastly, the inferior turbinated bone, rather small, having its fundamental, or articulating plate of bone, bifurcated at its extremity, each division being itself slightly enlarged at its terminal edge.

The inferior cephalic appendage, or lower jaw, is still more characteristic in the Sapajous than the superior. The rocky bone has still very nearly the same form and proportion; it is similarly perforated, inferiorly and posteriorly, by the carotid canal; the promontory or projection of the *cochlea*, on its external aspect, is pretty considerable; and the two *fenestræ*, or exterior openings, very near each other; the vestibular opening, very much cut down, is much smaller than the opening leading to the cochlea, which is very large. The *ossicula auditûs*, generally very small, are pressed up into a corner in the superior wall of the tympanum; the *stapes*, with its usual form, completely concealed in the fossa of the fenestra ovalis; the *orbicular*, very distinct and evidently excavated; the *incus*, short and thick, even in its branch, which articulates with the orbicular; and, lastly, the *malleus*, whose *head* is large, without being set off on a neck, the handle massive and short, and its horizontal or superior processes well marked. With respect to the *tympanum*, it is larger than in the Simiadæ, and, particularly, the external auditory canal is extremely short, and remarkable for its great diameter; the mastoid portion of the temporal is large, its process not more extended (swollen) than in the Callitriche (*P. Sabæus*), but the squamous portion of the temporal is very little extended, its superior edge almost horizontal, reaching only the elevation of the lower floor of the orbit; there is a large venous foramen at the posterior root of the condyloid process, which is strong; the condyloid cavity is transverse, and deep posteriorly, and the zygomatic process is sufficiently large.

With regard to the mandible (dentar portion of the jaw), properly speaking, its two branches, short and large, unite at an angle, nearer a right angle than in the Callitriche (P. Sabœus), and the angular process is evidently more marked, forming a rounded projection. The symphysis is also a little more oblique, and not so long, the two sides enclosing a parabolical figure, shorter and opener. The anterior opening of the dentar canal is not so near the base or lower margin of the jaw, but in other respects equally

plumb with the interval, between the first and second *anterior* molar teeth.

The cervical vertebræ form a neck, still shorter than in the Simiadæ, the vertebræ themselves are more locked, that is, their articulations are all closer.

The Atlas has, properly speaking, no inferior spinous process, but rather a kind of tubercle looking backwards.

The Axis has its superior spinous process dilated a little in the form of the handle of a hammer.*

The three intermediate cervical (3, 4, and 5) double each other very much, not only with regard to the laminæ, but the bodies, and the processes are generally small and slender.

The transverse processes of the sixth vertebra have their internal lobes (*anterior tubercle in human anatomy*) dilated, and its spinous process sometimes nearly as long as the seventh, or prominent vertebra. The transverse processes of the seventh vertebra are long, delicate, and always imperforate at their base.

The fourteen dorsal vertebræ are, like the cervical, more locked than in the Callitriche (*P. Sabæus*), the twelve anterior, having their spinous processes directed backwards, particularly towards the last, and the thirteenth and fourteenth dorsal vertebræ, or last two, have all the characteristics of lumbar vertebræ; their spinous processes are well-veloped, only, the last of the twelve anterior, or true dorsal, is larger, not unlike the lumbar vertebræ, although looking backwards, instead of being *scalaneid*, as in the Callitriche (P. Sabæus.)

The five lumbar vertebræ have their spinous processes proportionally larger, the transverse narrower, more oblique from before; those of the last lumbar vertebræ are the largest, not bifurcated, and the styloid processes of the posterior articular shorter and more obtuse. They present, in addition, towards the posterior margin of their arch, a narrow fissure, into which penetrates the anterior margin of the spinous process of the vertebra which follows.

The sacrum, formed of three vertebræ, of which, the articular or anterior has its spinous process greatly developed, very similar to those of the lumbar.

The tail, though shorter than in the Callitriche (*P. Sabæus*), is, nevertheless, formed of a greater number of vertebræ, at least, in a given length, there are fewer vertebræ in the tail of the Guenon, our African type, than in that of the Sapajou (*Cebus Apella*), our American type; there are, also, a greater number (five, or rather, four) of complete vertebræ; in other respects, they are very similar, and there are the same number of the V shaped bones found on the inferior aspect of the tail.

OF THE INFERIOR MEDIAN SERIES OR STERNEBRÆ.

The hyoid in the Sapajou (*C. Apella*), has its body larger, more excavated posteriorly, with its margin thin and very much folded anteriorly; the styloid horns are delicate, and formed of two portions, the one basilar, sternebroid, the other terminal, styloid; the laryngeal horns are, on the contrary, very large, particularly their base.

The sternum, like the series of dorsal vertebræ, with which it is analagous, is a little shorter, more heaped together, as it were; but it is, in other respects, composed of the same number of sternebræ as in the Callitriche,* and evidently of the same form, although all the sternebræ, and particularly the last, are evidently larger. Upon the whole, it is the median sternebra which is the largest, the two anterior and the two posterior decreasing as they become elongated.

We have little to say concerning the ribs; there are fourteen pairs, of which nine are sternal and five asternal; they are proportionally a little stronger and larger than in the African typical Monkey.

With regard to the sternal appendages (*cartilages of prolongation*), they appear to be, on the contrary, rather slender, and proportionally larger.

The limbs of the Sapajous (C. Apella) are, generally speaking, shorter than those of the Guenons (P. Sabæus), and even, perhaps, a little more equal in length.

With regard to the anterior, the scapula is generally smaller, and more oblique, by the anterior and superior angle being depressed; the proportion of the fossæ is still nearly the same, and the spine, equally elevated, is terminated by an acromion of the same form, that is to say, flat, and slightly recurved in front; the same remarks apply to the coracoid process, which is bent strongly inwards; and in descending, vertically and a little inwards; but the tuberosity, at its root, is strongly marked, spreading out and rising upwards, which, we observe, tends to convert into a hole, a deep fissure which exists on the anterior superior margin, and always well-marked in the Simiadæ, or African Monkeys.

* In the skeleton of the Cebus Apella, Fig. 37, this process (unhappily placed by the person who articulated the skeleton on the lower aspect of the neck instead of the upper) is deeply fissured mesially, throughout its whole depth, thus rendering it deeply bifurcated at the summit; but we imagine this to be an anomaly, and by no means a permanent character.

* As in the Simiæ, we sometimes find in the sternum of the Sapajous, that the interval between the sixth and seventh sternebra ossifies, and in that case there are eight sternebræ in all, when the apparatus is considered in the young specimen.

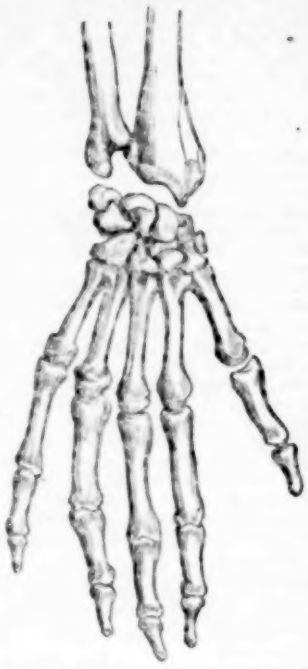
The clavicle, which can easily be recognised by its remarkable double curve, almost in the form of the letter S, and its large articulation, with the manubrium of the sternum, is certainly stronger than in the Callitriche (*P. Sabœus*), and even longer; it articulates extensively with the acromion process of the scapula.

The humerus is proportionally shorter, since it scarcely equals in length the thirteen anterior dorsal vertebræ, whilst in the Callitriche (*P. Sabœus*) it equals the whole of the dorsal vertebræ; it is besides less bent, and, as it were, less angular in its length or extent of the deltoid insertion; the internal tuberosity is more sloping than the external, which, however, is still the largest; the deltoid impression is a little indistinct; the inferior (distal) extremity is thinner, and, upon the whole, broader than in the Guenons (P. Sabœus); the external ridge is also more developed; the internal tuberosity is perforated with a pretty large oblique foramen, which does not exist in any of the Simiadæ, and thus forms an important generic character; lastly, the pulley occupies as large a space as the tuberosity in the radio-cubital articulation.

The radius nearly equals the humerus in length, and is very similar to that of the Guenons (P. Sabœus); perhaps it is a little stronger, its head is a little more transverse, its tuberosity is rather stronger, and descends further down on the shaft of the bone than in the typical African monkey.

The Ulna is, proportionally, still stronger, more arched in the opposite direction to that of the radius, and its olecranon process is a little thicker, more angular, and even more oblique, than in the Callitriche (P. Sabœus).

Fig. 38.



Hand, with the distal extremities of the radius and ulna, viewed from its dorsal or extensor aspect.

Fig. 39.

Same hand, viewed from its internal or radial margin.

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The resemblance between the carpus and hand of our typical American monkey, and that of the African, is still greater than that of the arm and forearm. The scaphoid occupies an equally small portion of the wrist joint, and the os triquetrum occupies the most considerable portion; the pisiform bone resembles a small calcaneum. There is an intermediate (ninth) bone, and the characteristic process of the unciform bone is largely developed; the trapezoides penetrates less, or is more dorsal.*

* The description of the carpus of the Sapajou, as given in the Systeme Anatomique de Vicq-d'Azyr, in the "Encyclopedie Methodique," translated from the "Anatomie des Mammiferes," by Guilleim Joseph, is certainly wrong; there are never more than four carpal bones articulated with the

The bones which compose the hand resemble, still more strongly, those of the P. Saboeus than even in the carpal region, except, perhaps, in their proportions; thus, as a whole, the hand, including the fingers, is larger; the bones of the metacarpal region are, on the contrary, shorter when compared to the first phalanges, and the thumb a little longer, since it nearly equals in length the little finger, which is scarcely more slender than the others.

The pelvic limbs, as I have already remarked, have a less proportion to the thoracic limbs than in the P. Saboeus, and this is sufficiently perceptible in each of its component parts.

Thus the ilio-pubic semi-girdle, although possessing the same form in almost all its points, has, nevertheless, a shorter total length, since from the anterior extremity of the ilium to the posterior extremity of the ischium, the length only equals three-fourths the whole length of the femur, whilst, in the P. Saboeus it is the four-fifth. Another more palpable difference exists in the diverging angle of the two branches of the ischium, which, although somewhat thicker, is not, however, spread out and enlarged like the ischiatic tuberosity of the P. Saboeus; this peculiarity is common to all the family of the Sapajous.

The femur, proportionally, also, perhaps a little shorter, differs only from that of the P. Saboeus in being a little straighter, the great trochanter not rising so high, and being more flattened.

The tibia, about an eighth shorter than the femur, whilst in the P. Saboeus those two bones are equal, is, however, very similar to it, and the fibula is almost a perfect counterpart to that of the Guenons; perhaps the malleoli are, however, a little more projecting, and, consequently, the articulation closer.

The resemblance is traced on, in respect to the proportions of parts, and for the bones of the feet, nearly as far as those of the leg, excepting in slight differential shades, which the artist alone can show. Sometimes it has appeared to me, that the tarsus of the C. Apella is a little more locked as it were, less flattened than in the P. Saboeus, and the great toe more opposable; and, indeed, the foot is more similar to the hand, and proportionally shorter. In truth, that portion of the calcaneum posterior to the articulation, scarcely exceeds the half of the hand, whilst in the Magot (*African Cynopithecus*) it is a little more than two-thirds.

All the skeletons or crania of the Sapajous, properly so called, which I have examined, have presented no ascending or descending differences in any of their component parts;* but this is not the case with some of the sub-families, which zoologists have arranged with the Primates (*Cebidæ*) of America.

In ascending the scale, and thus following the plan which, upon deep reflection, we have adopted, that is to say, passing from the C. Apella to the Atèles, Geoff. (*Cebus*, Erxleb. *Simia*, Linn) from the Atèles to the Sagouins (*Callithrix*, Geoff. Cuv. Illig. *Cebus*, Erxleb. *Simia*, Linn. *Sagouins*, Lacep.); and, lastly, from the Sagouins to the Alouates (*Mycetes*, Illig. *Alouata*, Lacep. *Cebus*, Erxleb. *Stentor*, Geoff. *Simia*, Linn.) or Harleur Simiæ, we can observe some differences, although they do not at all indicate a gradation so well marked as in the African Simiæ, from the Guenons, to the Chimpanzée.

The Atèles, or Sapajou, *without the thumb*, (as the name Atèles, under which M. Geoffroy distinguishes them, indicates,) have, in the more elongated general form of the head, a certain obliquity by the elevation of the cranium, which strikingly diminishes the extent of the facial angle by depressing the forehead.

The snout is also a little longer, more pointed, and the space between the orbits larger; the orbits are less notched on their external margin, and a little less lateralised.

The rest of the spinal column is very nearly, in all respects, similar to the C. Apella, only the dorsal vertebræ, which are, however, fourteen in number, have their spinous processes larger, more approximating to each other, and the two last directed obliquely from behind, although less so than in the others.

The lumbar vertebræ (only four instead of five in number) are also weaker, and their spinous processes much less oblique from before.

The last of the three sacral vertebræ very closely resembles the first coccygeal, its spinous process not even being included in the median crest; and this, without doubt, has caused Daubenton to state, that his specimen of the Atèles had only two sacral vertebræ; but, in the specimen which is now before me, the third sacral vertebra is certainly united with the other two, not only with the *body*, but with the transverse and articular process, and even with the ilium.

The coccygeal vertebræ are not only more numerous, amounting to thirty-one, or, according to Daubenton, 33 instead of twenty-

five metacarpal bones, and there are always four bones in the proximal row of the carpus.

* I find, however, that Daubenton states the skeleton of the Saï (*S. Capucina*) to have six lumbar vertebræ instead of five, as in our typical specimen; four sacral, instead of three; and twenty-six coccygeal, instead of twenty-two. This enumeration, giving no fewer than six additional vertebræ, if correctly given, will of course constitute a specific,—an almost generic, distinction.

two, (as in the *C. Apella*) but the vertebræ are generally longer. The first eight have a superior arch and transverse process, of which the longest and most oblique belong to a vertebra more posterior, the body of the more anterior vertebra being, at the same time, shorter; the five last only, are provided with the V shaped bones, which are of considerable size. Of the remaining coccygeal vertebræ, the first has a mere rudiment of the V shaped bone; but, on the other hand, the articular processes of the following vertebræ are very much developed.

The hyoid sternebra has its body in the form of a cuirasse, or breast-plate, very much swollen out, like the bird's sternum without the brisket, being larger, and more bent anteriorly than posteriorly, where it is also narrow.

The horns (appendages) which articulate with the anterior and superior angles, are very different from those of the C. Apella, indicating an animal more elevated in the scale; in a word, the anterior (styloid horns) are much shorter than the posterior, consisting of only one cartilaginous portion; the posterior (laryngeal) are rib-shaped, and long.

The sternebræ as a whole, and at the same time in detail, as well the vertebral as sternal appendages, are exceedingly like those of the C. Apella, only all the portions of the thorax, and especially the ribs, are evidently more slender, and the sternebræ are flatter; there are certainly eight sternebræ, as in the C. Apella.

This delicacy shows itself still more in the limbs, and in their various portions.

The scapula, more oblique and particularly small, since its whole length is to that of the humerus as 1 to 3, whilst in the Atèles it is as 12 to 21, showing (in the greater development of the tubercle at the root of the coracoid process) an arrangement by which the fissure, on the anterior margin of the scapula, is converted into a hole, by the junction of the terminal angle of that margin with the tubercle; and, as the external (scapular) end of the clavicle is evidenly very much enlarged, it follows that the articulation of the clavicle with the scapula is effected, not only through the acromion, but the coracoid process.

The humerus, whose length nearly equals that of the dorsal and lumbar vertebræ, is, besides, remarkable for its delicacy, its straightness, the slight development of its crests and tuberosities, its thinning away inferiorly, and the absence of a hole near the inner condyle,—most certainly a rather peculiar difference.

The bones of the forearm are still longer, almost equalling the entire vertebræ of the trunk, but proportionally still more delicate than the humerus; the radius is even slightly bent, but the ulna is perfectly straight, and knife-shaped in its upper segment; the olecranon process, on the contrary, is thin and rounded.

The carpus, notwithstanding the rudimentary state of the thumb, differs a little from that of the typical cebidæ, that is to say, the trapezium is at least as large as in the Sapajous; the intermediate (ninth) bone is, perhaps, on the contrary, a little less.

The hand is also narrower and longer than in the Sajou.

The bones of the metacarpus are the largest of the three divisions composing the hand; they are also much more delicate, and approach, in length, much nearer the ordinary proportions, only the first (that of the thumb) is, perhaps, proportionally a little shorter; it is, however, terminated by a small head.

The proximal phalanges, four in number, (the thumb in no case having one) are one-fourth shorter than the metacarpal; they are likewise sufficiently enlarged and arched towards their distal extremity, approaching in form that of the Gibbons and Orangs.

The middle phalanges are also a little more bent, and larger than in the C. Apella. With regard to the distal phalanges, they are, on the contrary, shorter and more pointed towards their termination.

The four divisions of the posterior limbs, preserve, with an extremely similar form, dimensions proportionally longer. Thus, the ilium and ischium have a total length equalling thirteen of the dorsal vertebræ, instead of eleven only, as in the C. Apella, the type of comparison; the iliac bones, also, are evidently longer, more fan-shaped, and rounded anteriorly.

The femur, which is only a little longer than the humerus, possesses, in other respects, the usual form, only the great trochanter is not so strong, and a little more elevated than in the Sapajous.

The tibia and fibula have also preserved the form and length of our type; they are only a little more delicate.

The foot preserves, also, its usual proportions with respect to the leg. We may remark, however, that the astragalean part is a little more loose, less locked, the malleoli being evidently less projecting. The metatarsal bones which are a little longer, but especially more slender, decrease in length from the first to the last, with the exception of that of the great toe, which is shorter and more set off at an angle.

The proximal phalanges preserve pretty nearly the same arrangement with regard to size; they are more arched than in the C. Apella, a disposition which shows itself also in the middle phalanges; the distal phalanges continue straight, and scarcely dilated at their extremity.

I have observed no other differences in the osteography in the different species of the genus Atèles, except that in the one which is provided with a rudimentary thumb, we find, on the first metacarpal bone, a very small

phalanx, which supports the terminal phalanx without a nail.

The Sagouins (*Callithrix* Desm. Geoff.) which appear to me still more closely to resemble the Alouates than the Atèles, retain, nevertheless, the proportions of the Sajous, so far at least as I am able to judge by their cranium, the only portion which I possess of their skeleton.

The general character of the head is similar to the Atèles, the forehead sloping rapidly backwards, the occipital bone and the zygomatic arch being elevated in the same direction; nevertheless, the facial angle is very open (60°) first on account of the extreme shortness of the snout (even greater than in the Sapajous), and then, owing to the extreme smallness of the frontal crests, which give to the face and forehead a subvertical line. In other respects, the inter-orbitar space, the zygomatic arch, and the malar foramen, are still larger than in the Atèles; but there is no venous foramen behind the condyloid processes. The snout is at least as pointed, the nasal orifice is also of the form of a clover leaf, and the angle of the lower jaw is much larger, more rounded, and even slightly approaching the Alouates, and, unquestionably, for the same reason; lastly, the coronoid process is narrower, more elevated, and especially more arched.

The Alouates, including also the Eriodes, which present merely a descending shade from the Atèles, enter, perhaps, more perfectly, in certain respects, into the common type than the Sagouins, and even the Sapajous without the thumb.

The cranium and its appendages present a more oblique arrangement, especially in the aged males, which reduces the facial angle, until it does not exceed thirty degrees, but we know that that effect is produced by the development of the body of the hyoid, which necessitates a proportional development of the vertical branch of the lower jaw; its angle, large and rounded, and consequently pushing upwards its condyle, and, following as a necessary consequence, the posterior part of the cranium, whose inferior line is entirely turned upwards.*

In addition, the face and forehead, also, form nearly a straight line from the sinciput to the extremity of the incisive bones, and the zygomatic arches, much larger than in the other Sapajous, and not unlike the Sagouins, are parallel with the face and forehead. The lower jaw is somewhat like a bellows, so oblique and contracted is its anterior extremity, and its inferior margin, rounded, parallel to the extremely concave dentar edges, following the convexity of the upper jaw.*

All the characteristics of the crania in the other Cebidæ, in other respects, reappear, in that of the Alouates, only a little more developed; thus the inter-orbitar space, and the malar foramina, are greater even than in the Atèles, and all the ridges, and depressions for muscular insertion, are much more fully developed.

In respect to the other parts of the skeleton, they altogether resemble those of the Sajous, not only in number of pieces, in proportion, but even in the form of the various portions.

The cervical vertebræ have, nevertheless, their spinous processes more raised and more developed: these processes are also larger in the lumbar vertebræ, the transverse processes of the lumbar vertebræ being also more horizontal. The first of the lumbar vertebræ (five in all) as in the Sajou's, has a delicate process, which might be considered as a rib united to it, and which, in fact, is like a rib directed posteriorly.

The three sacral vertebræ have their spinous processes so large that they form a continuous crest.

The coccygeal vertebræ (thirty in number) are in other respects very similar to those of the Atèles, not only with regard to the individual vertebræ, but also in the V shaped bones; they are, however, generally and proportionally a little shorter.

The hyoid sternebra (Figs. 40, 41, and 42,) of the Alouate Roux (*C. Seniculus*, Linn. *Mono Colorado*. Humb.) has long been remarkable for its very extraordinary form; in fact, with age, and especially in the male, it is developed in the form of an enormous oval bulb, oblique, and perforated with a large opening at its posterior base, as seen in Fig. 42, leading into an enormous cavity, midway between the two rami of the lower jaw; the styloid horns, which have become very much depressed, the opening of the pouch being between the two pairs, are still more rudimentary than in the Atèle and Saki, so much so, indeed, that in the adult they have altogether disappeared, a fact by no means so apparent in youth; the laryngeal horns are, on the contrary, sufficiently long to reach the superior angles of the thyroid cartilage.

* Our author's language in the preceding passage must not be misunderstood. It is for the purpose, no doubt, of giving brevity to the description that the term "necessitates" is made use of.—R. K.

* Daubenton, xv., page 87, speaks of a kind of articulation near the condyle, which is not found in the other Cebidæ, and is thought by him to be peculiar to the Howling Apes; but certainly the hyoid bone, however swollen it be, does not go so far as to give rise to such a joint, and this surface, which the celebrated colleague of Buffon took for a joint, is, unquestionably, the surface of insertion of the internal pterygoid muscle.

Fig. 41. Fig. 40. Fig. 42.

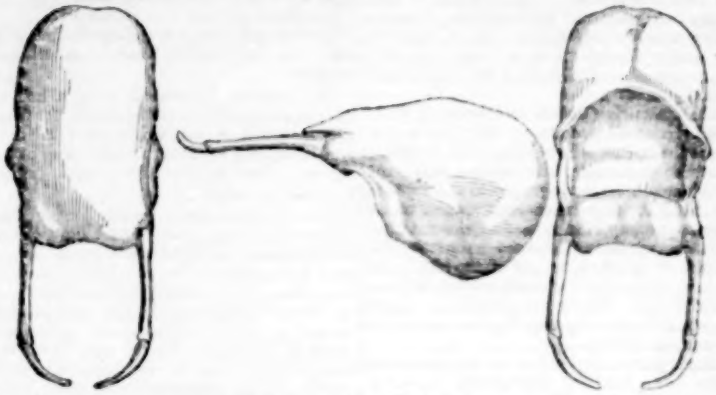

Fig 40. Hyoid apparatus, viewed in profile; 41, The same from above; 42. The same from below.

The sternum is even shorter than in the Sapajous; besides, it is formed of only six sternebræ, including the xiphoid, which is very slightly developed, and entirely cartilaginous, which is also the case with the small sternebræ belonging to the seventh and eighth ribs.

The manubrium, or first portion of the sternum, appears also more deeply notched anteriorly than in the other Sapajous.

The ribs are fourteen in number, eight sternal, and six asternal, being the same as in the Sajous; but they are evidently a little less than in those animals, but not so delicate as in the Atèles.

The proportion of the limbs is peculiar to the group, the anterior are nearly equal to the posterior; on the contrary, the posterior are much longer in the Sajous, but they are much stronger, and not so delicate as in the Atèles.

The scapula is, perhaps, even still larger than in the Sajous, especially in the greater development of the fossa supra-spinata; the increase in length of the anterior (cervical) margin, which runs gradually into the anterior and superior angle, and the prolonged, spatula-shaped, obliquely raised, basilar process of the coracoid.

The clavicle is, on the other hand, of a delicacy altogether remarkable, so as to form quite a contrast with the humerus; it is, moreover, nearly straight.

The humerus, nearly equalling in length that of the femur, does not, nevertheless, quite equal the fourteen dorsal vertebræ. It is, however, strong; its deltoid ridge is well-marked and sharp; there is no foramen in the internal condyle, as in the Atèles, which, on the contrary, is present in the Sapajous.

The forearm is proportionally still shorter than in the Sajous; in fact, the length of the radius is evidently less than that of the humerus, the reverse of the arrangement in the Atèles; its form, and also that of the ulna, resembles greatly that of the Sajous; the two bones being, however, proportionally a little longer, and more delicate.

The hand resembles the forearm, in being intermediate between the Sajous and Atèles, resembling, however, more that of the Sajous, in consequence of the invariably constant existence of a thumb; but the proximal phalanges are stronger and, particularly, much more arched than in the Sajous.

The posterior limbs are extremely like the anterior, although, proportionally, not so long.

The pelvis presents only a few specific differences; the same may be said of the femur with regard to form; it is, nevertheless, a little longer in comparison to the bones of the leg, which, in every particular, resemble those of the Sajou, only the external and internal malleoli are not so prominent.

The foot preserves, also, its resemblance as well, generally, as in each constituent part, to the common type, Fig. 37.

*Descending Scale.*

The osteographical differences are, perhaps, better marked in the descending series from our common type.

All the remarks which we have just made on the skeleton of the Alouates, may be rigorously applied to the species of the Cebidæ, whose external characters have led M. E. Geoffroy to distinguish it under the name of Lagothrix. (*Lagotriche*, Desm. *Cebus*, De Blain.) I may also just remark that in the skeleton of the Grison, in the

Museum, which was that of a young animal, the coracoid process of the scapula is distinctly in the state of an epiphysis, a peculiarity which exists also in our skeleton of the young Chimpanzée, of Buffon, a fact which I neglected to note in the description of that animal.

The Saïmiris (*Callithrix sciureus*. Desm. Geoff.) a small species of the Cebidæ, in which the tail is entirely hairy, and scarcely, if at all, prehensile, still bears a strong resemblance in its osteography to the Sajous; the head is only much longer, and as if drawn out superiorly, so that the external auditory aperture is placed almost in the middle of the whole length of the head, and the occiput extends greatly behind the vertebral canal. The lower jaw is also much longer, and more depressed or less arched, in its vertical branch.

But a peculiarity, which is proper to the Saïmiris, is, that the inter-orbitar septum is incomplete, by the absence of that bone, known by the name of the *os planum* (orbitar plate of the ethmoid in human anatomy); in other words, by the non-development of the lateral masses of the ethmoid, and also, that the entire cranium appears as if distended, the bones being extremely thin and loose, not only in their articulations, but in their texture. These two peculiarities, and more especially the incomplete state of the orbitar cavities, and the close approximation of the optic foramina, give the orbits somewhat the appearance of those in Birds.*

The remainder of the skeleton does not appear to me to present differences of the least importance, at least so far as I am able to judge from the inspection of the skeleton of a young animal, the only one in our collection. The number of the dorsal vertebræ is only thirteen; but there are seven lumbar, a number which we shall find very generally present in the species terminating the series, and evidently leading towards the Carnivora. The lumbar vertebræ are also remarkable for the antero-posterior direction of their imbricated spinous and transverse processes.

The sternum has seven sternebræ, with an internal nucleus for the eighth; all these sternebræ are much flattened.

The ribs are thirteen in number, of which eight are sternal and five asternal.

The limbs are long and delicate.

The scapula short, leaf-shaped, that is to say, oval and equally convex on its two margins.

The humerus is perforated by a hole on its inner condyle; it is evidently considerably longer than the two bones of the forearm, which are exceedingly like those of the Sajous. The intermediate carpal (ninth) bone is very small.

The posterior limbs, much longer than the anterior, have a very short ilio-ischiatic measurement; a femur one-fourth longer than the humerus; the tibia and fibula delicate, close, almost straight, nearly as long as the femur; and the foot narrow, but equalling the leg in length, is terminated by the nail bearing phalanges, which are, even still more pointed, than in the Sajous, and without depressed enlargements at their distal extremities.

The Sakis (Cebus *leucocephalus*, *Pithecia leucocephala*, Desma.) in whom the tail is extremely supple, approaches, still less perhaps, the Sajous than the Saïmiris, at least in the form of its cranium, for we observe that the arrangement of the incisive teeth in the lower jaw, resembles more that which occurs in the Makis. The cranium, in its superior outline, resembles also very much the Sajou; but the inferior outline is much less curved at the sphenoidal junction, in such a way that the occiput is slightly raised, resembling in a slight degree the arrangement observed in the Alouates, and, undoubtedly, for the same cause, for the branches of the lower jaw are very much dilated at their angle, and the zygomatic arch is a little oblique; there is no venous opening behind the condyles; the jugal bone is rather small, and the anterior opening of the inferior dentar canal is almost as large as the jugal foramen.

Certain portions of the skeleton of the Sakis approach, in their structure, the terminating species of the Sapajous, or the *Microcebes*, inasmuch as they have only twelve dorsal and seven lumbar vertebræ. Another remarkable peculiarity is, that as in the Ouistiti, the body of the hyoid becomes again of considerable size, its anterior horns being reduced to minute cone-shaped cartilages, the posterior horns being cask-shaped; but this enlargement of the body of the hyoid is not in unison with the development of the branches of the lower jaw, which, in this species, is determined by that of the thyroid cartilage.

The internal condyle of the humerus is perforated with a hole, as in most of the Sapajous.

The Douroucouli (*Cebus Trivirgatus*), a small nocturnal species of the Cebidæ, resembles the Sagouins, in many points of the structure of the cranium; but the remainder

* What could Daubenton have meant, when he described the opening of the nostrils in the Saïmiris as being between the orbits, as well, adds he, in the Gibbons and in the Talapoins? This is really what I cannot understand. The nasal aperture is of a trefoil shape, or, perhaps, exhibiting four rounded lobes, but it is not higher up than in the Sapajous! With respect to the little bone which he describes, as placed between the bones of the nose and frontal, this must evidently be a supernumerary bone, and, in all probability, peculiar to the particular specimen from which Daubenton drew his description.

of its skeleton has evidently a much greater resemblance to the Saïmiris.

The head, as a whole, resembles, slightly, that of certain small species of Makis, by the great extent of the orbits, and even that of the cat tribe, or pure Carnivora, by the continued arch of the frontal and nasal bones, the nasal openings being subterminal; the cranial vault, slightly elongated, extends posteriorly considerably beyond the occipital foramen, and the snout is excessively short, the zygomatic arch is delicate and oblique, the external orbitar foramina are very small, and two in number; the sphenoidal fissure is very large; the coronoid process of the lower jaw is evidently much more elevated than in the Sajous, and more resembling that of the Sagouins.

The skeleton of the Douroucouli (of which we possess a perfectly complete natural skeleton, made under our own immediate inspection, and from a specimen which has been drawn by Mr. Fred. Cuvier) has fourteen dorsal vertebræ, with the spinous processes nearly resembling those of the Sajou; but the lumbar region, greatly elongated, is composed of eight vertebræ, increasing in dimensions, very evidently, from the anterior to the posterior, as well in their bodies as in their spinous and transverse processes, more especially the last, their transverse processes being directed very much forward. The sacrum has three vertebræ, united even by their spinous processes; and the tail, of which the first four vertebræ only are complete, is composed most certainly of no more than twenty vertebræ, and these all elongated and unequal; the V-shaped bones are of small size, and connected with the first four or five coccygeal vertebræ only.

The sternum has its eight sternebæ well formed.

The ribs, fourteen in number, of which the nine sternal are large, flat, and very thin; their cartilaginous portion is long and narrow.

The limbs and their component parts resemble, strongly, in their proportions and form, those which we have just described in the Saïmiris.

The scapula, however, is proportionally larger, equalling two-thirds of the humerus, whilst it scarcely exceeds the half in the Saïmiris; the humerus, also, is perforated with a short canal on its internal condyle. The two bones of the forearm are proportionally longer.

The ilio-ischiatic measurement is only a little shorter than in the Saïmiris; but the thigh, leg, and foot, present scarcely any appreciable differences, except to the artist.

Lastly, the terminating species of the Cebidæ, or American Monkeys, comprehends the Tamarins and the Ouistitis, in which the great toe is no longer opposable, and the nails have the form of claws.*

In all the smaller sized Cebidæ, the general form of the head bears the strongest resemblance to that of the Saïmiris and the Douroucoulis, by the more or less elongated

* We feel inclined to except the distal phalanx of the great toe, which, most assuredly, still retains its flattened form, and in the stuffed specimens we have seen, the horny envelope invariably appeared more like a nail than a claw. We find this feature most distinctly marked in a specimen of a natural skeleton of the Ouistitis in our own private Museum. The specimen was kindly presented to us by Sir James Robisson, and prepared by Mr. Fred. Knox, with great care. We add the following measurements and observations on this specimen, seeing they are so rare in Britain:—

| | in. | lin. |
|---|---|---|
| Length from snout to sacrum | 5 | 2 |
| —— from sacrum to tip of tail | 7 | 4 |
| Total | 12 | 6 |
| Humerus, 1 in. 3 lin.; radius, 1 in. 3 lin.; hand, 1 in. 5 lin. | 3 | 11 |
| Femur, 1 in. 3 lin; tibia, 1 in. 9 lin.; foot, 2 in. | 5 | 0 |
| Diastemic measurement from snout to occiput | 1 | 9 |
| —— over zygomatic arches | 1 | 0 |

| | | |
|---|---|---|
| Vertebræ, Cervical | 7 | |
| Dorsal | 13 | |
| Lumbar | 6 | |
| Sacral | 3 | |
| Coccygeal | 22 | |
| Total | 51 | |
| Teeth, upper jaw, Incisors | 4 | |
| Canines? | 2 | |
| Molars | 8 | |
| | —14 | |
| Lower jaw, Incisors | 4 | |
| Canines | 2 | |
| Molars | 10 | |
| | —16 | |
| Total | 30 | |

It will be observed, that the lower jaw has two molars more than the upper, and the *fourth* molar (counting from before backwards) is by much the largest; it has four tubercles, two on the external margin, two on the internal margin, the posterior internal tubercle being much smaller than the others. In the upper jaw, where we have two teeth fewer than in the lower, it appears to us by no means easy to determine which of the teeth are wanting, at all events, from their external appearance as placed in the jaws. The teeth wanting, however, must either be molars or canine, and it appears to us that they are the canine teeth which have not cut, seeing that the large molars analagous to

form of the cranium, and especially by the shortness of the snout, insomuch that the facial angle might safely be considered as averaging 50°, the forehead and face becoming vertical; the plane of the orbits is very slightly oblique, that of the nostrils is likewise nearly vertical, the nasal bones are parallelogramic, instead of being triangular; lastly, the angle of the lower jaw assumes more the form of a process.

The rest of the skeleton preserves also the same characters; the anterior limbs, however, are, perhaps, still shorter in comparison than the posterior.

The number of the dorsal vertebræ decreases to twelve, although there may, at times, be thirteen, as in the Ouistiti; and when there are thirteen dorsal, the lumbar will be only six, instead of seven, which is the most usual arrangement. The spinous and transverse processes are long, and look or point from before backwards. The sacral vertebræ are often two, but sometimes three, in number, but the first only articulates with the iliac bones. With regard to the coccygeal vertebræ, they are sometimes, when the tail is very perfect, twenty-eight or thirty in number; they are of the usual form and proportions.

It is worthy of remark, that the hyoid apparatus has still its body large, but without the cavity (*as in that of the Alouate Roux*, Fig. 40, and particularly that the styloid horns are, again, reduced to an extremely small tuberculous point, and in a cartilaginous state, situated at the base of the laryngeal horns, which are very large, having some resemblance even to the first ribs in man.

The sternum is never formed of more than seven sternebræ, including the two terminal; they are large and flat, but in the Ouistiti they are only six in number, the sternebra between the fifth and terminal (*xiphoid*) not having ossified.

The ribs, twelve in number (rarely thirteen, as in the Ouistiti), are still large and flat, with the exception of the last, which is straight and delicate.

The anterior limbs, shorter as a whole, and also in each particular division, have, in other respects, an almost perfect resemblance with those of the Sajous; the same form of scapula, clavicle, humerus, whose inner condyle in the Tamarin is even perforated with a short canal, which, however, is not the case in the Pinche, nor Ouistiti; the similarity still continues with regard to the radius, ulna, and carpal bones, metacarpal, and fingers; the intermediate (ninth) bone of the carpus is even proportionally a little larger than in the Sajous, the trapezium being, on the contrary, evidently smaller; but the distal phalanges, including even that of the thumb differ, especially in being short, straight, compressed, and delicate.

With regard to the posterior limbs, the pelvis differs slightly from that of the Sajous, inasmuch as it forms a more obtuse angle with the vertebral column, articulating, in fact, with only one sacral vertebra. The iliac bones are also, perhaps, a little narrower.

In respect to the femur, tibia, and fibula, I found no differences worthy of remark; and I may say the same with regard to the foot, with the exception of the tuberosity of the calcaneum, which is considerably more pulley-shaped, and the distal phalanges, which resemble those of the fingers.

SESAMOID BONES.

The number and arrangement of the osteides, or sesamoid bones, do not appear to me to differ much from those of the Simiæ, or African Monkeys.

In the anterior limbs, we find the sesamoid belonging to the tendon of the *abductor longus pollicis*. I have not found that of the *flexor carpi ulnaris*, and even Daubenton does not appear to have been more fortunate in finding it; in fact, the carpal bones, including the osteides, in the Cebidæ never exceed ten in number.

The sesamoid bones, belonging to the tendons of the perforating flexor muscle, are extremely minute.

In the posterior limbs, the rotula is oval, large, subhexagonal in the Sajous, and in the other ascending species; but in the descending species it became narrower and regularly oval.

The sesamoid bones, developed in the tendons of the gastrocnemii muscles, are pisiform, and large; that of the popliteus muscle does not appear to me to be present in the Sajou; in a young Atèle it was extremely small and flat.

In the foot, we find the sesamoid of the abductor of the great toe; of the long peroneal muscle; that in the tendon of the flexor of the great toe of considerable size, and those in the short flexor of the other toes extremely small.

OF THE TEETH (*Phanerostea*).

The system of dentition in the Cebidæ, or American Apes, resembles, in many respects,

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those in the lower jaw, are distinctly present. If we are correct, the permanent canines in the upper jaw have not appeared, and there is no apparent space for them in the jaw, although those in the lower jaw are of considerable size, although evidently recently cut.

It seems sufficiently curious, and extremely interesting to observe, that the dentition, as we approach the lowest terminus of the Quadrumana, or the last of the Cebidæ (American Monkeys) appears to return to that type, persistant and characteristic in the Simiæ, or African Monkeys, and which we have seen so closely to approach the human organisation.—*R. Knox.*

in its general arrangement, that of the Simiæ, not only in their general form, but in the number of the three sorts of teeth which constitutesthe system; the chief difference, however, consists in their having an additional (*anterior?*) molar.

The incisive teeth in the Cebus Apella, our typical specimen, are in general smaller,

Fig. 43.

Fig. 44.

Fig. 43. Upper jaw, right side, dentar aspect; 44. Lower jaw, right side, dentar aspect.

shorter, more transverse, than in the typical Simiæ (*Pithecus Sabæus*), and more especially the first pair of the upper jaw, can scarcely be distinguished from the second.

The canines are, also, generally not so strong, less sloping; nevertheless, in the male adult, they are thick, strong, sloping outwards; those in the upper jaw very distant from the incisors, grooved and cutting; the canine teeth in the lower jaw, smoother and crotchet-shaped.

The molar teeth, in both jaws, commence in close connection with the canines; they are also very close to each other; there are three *anterior* molars, one *principal* molar, and two *posterior* molars.

The three *anterior* molars are transverse both in the upper and lower jaw, that is to say, their transverse measurement is greater than their horizontal, and consist, as it were, of two parts, one external the other internal; those in the upper jaw being unequal, the internal division of the tooth having the form of a heel, but those parts are equal in those of the lower jaw, and are united by a transverse ridge, with the exception of the first tooth, which is evidently much stronger, and the external point of which is increased by a small anterior tubercle.

Of the three remaining molars, the first or *principal* is the strongest, both in the upper and lower jaw; less square, or more transverse in the lower jaw than in the upper; the terminating tooth of the series is evidently the smallest; it is oval, and placed obliquely in the upper; nearly round in the lower jaw. Of the four tubercles which the corona presents, two are reunited by a transverse ridge, the posterior tubercles in the last tooth of the upper jaw, the anterior in the last tooth of the lower jaw.

The arrangement, which we have just described as existing in our typical Apella, is the same in all the ascending series, with very slight modifications.

In the Atèles (*Atèle Belzebuth. C. Brissonii*), for example, we observe this difference, viz., that the incisives are much larger, more cutting, and arranged more in a circle.

The canines, and generally all the molars, are, on the contrary, much smaller; the molars are also rounder, and the tubercles on their coronæ are less marked, less ridged. The three anterior decrease from the first to the last, as in the Sapajou; but in the lower jaw, the intermediate molar is a little stronger than the first, and the posterior molars in both jaws have, in the form of their posterior divisions, something which indicates an approach to the structure of the Gibbons.

The Sagouins (*Callithrix*, Geoff.) have an arrangement of their dentar system which slightly approaches that of man, chiefly because the teeth are almost all of equal height; the canines being extremely short, and the incisives, also, are implanted vertically in the jaws. The first superior incisors are, in the meantime, proportionally much larger than in the Sapajou. The canine teeth, and

more especially those of the lower jaw, scarcely pass beyond the others. The molars of the upper jaw increase regularly from the first to the last but one, which is nearly of the same size and of an oval form. The first five have a large tubercle internally furrowed with two crescents, and one or two small tubercles externally, according as they are anterior molars or not. The six molars in the lower jaw increase regularly from the first to the last inclusive; but this latter is a little narrower than the one before it.

In the Alouates (*C. Seniculus*, *Stentor Seniculus*, Geoff. *Simia Seniculus*, Linn.) the incisives and canines, again, become very much as they are in the Sapajous, the incisives being small, nearly equal, and transverse; the canines being sufficiently long, crossed, and diverging; the molars resemble those of the Sagouins, only both in the upper and lower jaw the last molar is, proportionally, still a little stronger, by the enlargement of its keel, which is, nevertheless, slightly less marked in the Cebus Arachnoides (*Atèle Arachnoide*. Desm. Geoff. typical of the genus Eriode of Geoff.) and which, as well on this account as owing to the shortness of the thumb, forms an approach towards the Atèles. In the Alouates the tubercles of the corona of the posterior molars, are also more complex than in the Sapajous; in fact, superiorly, the *principal* molar more especially, is edged externally with an anterior external tubercle, and two internal ones; and of these two, the anterior larger than the posterior, wears away into a crescent-shaped surface; and in the lower jaw, this wearing away, acting upon the two pairs of tubercles, produces two obliquely transverse crescents, the anterior often more elevated than the posterior.

If we now proceed to examine minutely the dentar system of the Cebidæ, in the descending series, we shall find, in the first place, in those in whom there are still six molars, that is to say, in the Saimiris (*C. Sciureus*, *Sagoin Saimiri*, *Callithrix sciureus*, Desm. *Simia sciurea*, Linn.) the arrangement and proportion of the incisors, of the canine, and even the molars, resembles that of our typical specimen; perhaps, however, the last molars, as well in the upper as in the lower jaw, are still smaller in them; but, assuredly, the sharp and hollow parts of the corona are more marked, more insectivorous or cutting.

In the Sakis (*C. Leucocephalus*. *Pithecia leucocephala*, Desm. Geoff. *Simia pithecia*, Linn.) the molar and canine teeth are as in the Sapajous; but the incisors are much more inclined outwards, particularly those in the lower jaw, where they are long, narrow, converging, almost as in the Makis (*lemur*.)

Lastly, in the few species in which there are only five molars on each side of each jaw.

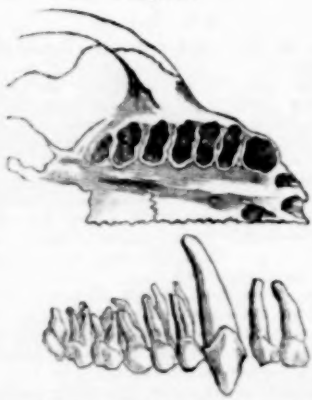
The Tamarins, (*Ouistiti*, *Midas*, Desm. Geoff.) which commence the descending series, have the incisors, the canines, and even the anterior molars, as in the Sapajous, and especially as in the Saïmiri; but the principal and posterior molars approach in form and proportions those of the two posterior molars in the Sapajou, indicating, to all appearance, that it is the *principal* molar which is wanting.

In the Ouistiti, which have the same number of molar teeth, it would rather appear that it was the last molar which had disappeared, because the third of the series is larger and has four tubercles. But the great distinctive marks, which we observe, are in the length and narrowness of the incisors of the lower jaw, which, differing but slightly from the canine, are, like them, directed forwards, like the teeth of a comb.*

*Of the Alveoli.*

After what we have just said of the corona in the dentar system of the Cebidæ, we can readily perceive that the roots, and consequently the alveoli, must present no great complexity.

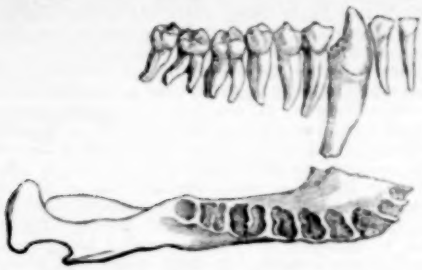
Fig. 45.



Upper jaw, right side, dentar aspect, with the teeth removed, and represented so as to show the alveoli and the fangs of the teeth.

* In so far as we can observe, M. De Blainville has not given any positive data to determine which of the series shall be considered as the *principal* molar. If we take as a character the size of the tooth, and man as a type of comparison, then it would appear that in the Ouistiti (whose teeth in regard to number are similar to man) there is a *posterior* molar *less* and an *anterior* molar *more* than in man. We have always considered the first *permanent* molar (in fact the first of the permanent teeth) in man, as the *principal* molar. Now, notwith-

Fig. 46.



Lower jaw, right side, dentar aspect, with the teeth removed, and represented so as to show the alveoli and the fangs of the teeth.

In the Cebus Apella, in fact, the incisors and canines have, invariably, a suit of roots, long and conical, which also indicate the form of the alveoli. The *anterior* molars have, like their coronæ, their roots compressed, forming two roots, more or less intimately united at their base, and diverging at their summit, which gives to the alveoli the form of a keyhole, instead of three holes in a triangle, which we have seen in the alveoli in the upper jaw of the Simia (see Fig. 33, p. 325); and with regard to the principal and posterior molars, their roots and the alveoli also resemble, in a slight degree, those of the Simiæ. In truth, in the upper jaw for the three first molars, there are three oblique alveolar holes, two of them small, very close together externally, often running together at the entrance, and a larger one internally; the teeth have also their three roots, two externally, diverging, and one root internally, which, however, is by much the strongest. The last molar has only one compressed root, corresponding to one oval and oblique alveolar cavity.

In the lower jaw (Fig. 46,) the arrangement of the dentar system and their alveoli is similar to that of the Simiæ, only, the three *anterior* molars have their roots simple; that of the first being much longer than the others, in which it is also more tetragonal; we have thus three alveoli-like keyholes, one for each tooth. The *principal* and first *posterior* molars, as well as their alveoli, are thus sufficiently similar to those of the Simiæ, having two compressed roots, diverging, and a double alveolus, like a keyhole; but the last *posterior* molar is always characteristic, its root being single, conical, and implanted, in a nearly circular alveolus.

In comparing with what we have just seen in the Cebus Apella, the ascending species, that is, the Atèles (*C. Brissonii*), the Sagouins (*C. Apella*) and the Alouates (*C. Siniculus*), we have observed no other differences than in the proportion of the root, and of the alveolus of the last molar tooth, as well in the upper as in the lower jaw, and even that difference is very slightly marked; and only in the Sagouins with regard to the last molar in the lower jaw, which has two roots and only one alveolus, and especially in the Alouates, where that peculiarity is generally present in the upper jaw. In respect to the Atèles, all the difference which they present, as compared with the Sapajous, is in the more rounded, more closely arranged, form of the root and alveoli.

The first species of the Cebidæ, in the descending scale from our type, have the roots of their teeth, and the alveoli, perfectly similar to the Sajous; but it is not precisely so in the Microcèbes or Ouistitis. Nevertheless, in all the lesser species, the difference is not observed, in the first three molars, which have always only one root and one alveolus like a keyhole; but the fourth molar of the upper jaw has three roots, and their alveoli slightly separated, and that of the last molar, both in the upper and lower jaw, are simple, which gives rise to the belief that in the Ouistiti it is the absence of the *principal* molar which constitutes essentially the difference in their dentar system from that of the Sapajous.

### *Growth of the Teeth.*

I have not, unfortunately, in so perfect a manner, as in the case of the Simiæ, the proper elements to determine the changes which age produces on the dentar system of the Cebidæ; I consider, nevertheless, as A *First Epoch* that state which I have ob-

standing M. De Blainville's extensive opportunities and scientific accuracy in all things, he does not appear to have determined, from observation, whether the first *cut* permanent molars in the Primates are the largest.—*R. Knox.*

served in a young specimen of the Chamek (*C. pentadactylus*, *Atèle pentadactylus*, Geoff.) The incisors are vertical, very small, loosely placed (not close) in a shorter oval palatine surface, in other respects not unlike those of the adult; the canines resemble the first *anterior* molars of the adult, with an angle more developed. With respect to the molars, there are already three, two *anterior*, and the *principal* molar, making in all 24 teeth. Thus, in the *first* epoch, the Cebidæ differ from the Simiæ in having an additional molar.* In the same epoch a Sajou has the incisives, and especially the canines, much stronger; and a specimen of the Ouistiti, at about 37 days after birth, has the incisors very much developed, with the canines, on the other hand, smaller than the two first molars; and the third molar has its anterior tubercle just cut. Thus, there is only an extremely short period of time in which the two first molars are alone present.

In the *Second Epoch*, with the incisives replaced by permanent, and the canines deciduous, 3 molars exist, as in the first epoch, which, in respect to number, resembles the arrangement in the Simiæ or African Apes; the first molar, evidently much smaller than the second, and the last much stronger, with three roots in the upper, and two in the lower jaw. This epoch, then, has 24 teeth, as in the first epoch; it appears the same in those Cebidæ, with the six molar teeth, as well as those with five. I have, in fact, observed it to persist in the Atèle, in the Saïmiri, and in the Ouistiti, and by sure induction in the Alouate and Tamarin.

It is nearly the same with regard to the *Third Epoch*, in which everything resembles strongly that of the second, with the difference, that there is an additional molar; thus making, with the three of the first epoch, four in all on each side of each jaw; that is 28 teeth in all. I have observed this condition in a young Alouate roux (*C. Seniculus*, *Simia Seniculus*, Linn), and in a Tamarin (*Ouistiti*, *Midas*, Geoff.)

The *Fourth Epoch*, of which I have seen an example in an Alouate noir (*Alouate caraya*, *stentor niger*, Desm. Geoff.) and in a specimen of the Ouistiti. In this condition of the dentar system there are, together with the three molar teeth of the first epoch, as in the two preceding epochs (2 and 3), two, or one permanent molar, which brings the number of molars present to five in the Alouate, 32 in all, or to four in the Ouistiti, 28 in all, the last molar being wanting in the Ouistiti. It is in this, the fourth epoch, that the change of the deciduous molars takes place by the successive throwing off of each of them. The first of the deciduous, the smallest being replaced by the largest permanent; the second deciduous, by a second of the permanent; and, the last deciduous, by the third permanent molar. This arrangement, I have observed, in a satisfactory manner on a head of the Alouate noir (*stentor niger*, Geoff.), in the collection in the Museum.

In respect to a *Fifth Epoch*, there are, then, still the same number of teeth as in the 4th epoch, but they are all permanent, and there remains only to complete the dentar system, the cutting of the last molars, which precedes, or, without doubt, immediately follows the change of the canine teeth as in the Simiæ; in the one case making 34 permanent teeth, and in the other, 32. I have observed the first condition in a young Sapajou grison (*C. Griseus*, *Sajou Gris*, Buff. *Cebus Barbatus*, Geoff.)

The result of trituration on the molar teeth in the Cebidæ is thus very similar to that of Simiæ, commencing on the *principal*; the effects decrease from behind forwards, in regard to the *anterior* molars, and from before backwards, with respect to the *posterior* molars, which is in the order of their original appearance.

ENDEROSTEA.

The other hard parts, which enter into the organisation of the Cebidæ, are limited as in the Simiæ to the bone of the penis (*enderos*), which is also extremely small, subcylindrical, evidently curved towards its free extremity; in the Cebus Apella, our typical specimen, it only equals 4½ lines in length.

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* Our readers will, by referring to our note on page 366, see how desirable it would have been to have given a fixity of character to the so-named principal molar. The condition of the teeth in this specimen, is evidently strictly analogous to that of the child, when he has all his deciduous teeth still in the jaw, with his four permanent molars additional, the total number in both jaws being then 24, of which 20 are deciduous. Our author appears to us to have erred, in using the term *principal*, to any tooth of the deciduous series. The term, in our opinion, would have been much better preserved for that permanent molar which is first cut, without any reference to the size of the tooth.—*R. Knox*

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INOCULATION OF SMALL-POX.—Dr. Corbett, of Innishannon, Ireland, writes, "the mischief accruing from *itinerant* inoculations in this country is truly shocking, and for nearly eighteen years, in which I have been in practice in an extensive district, I have never known variola to make its appearance, excepting after the visit of the inoculator. At this moment, small-pox is raging here to a great extent, and I have traced its introduction to the itinerant."

# LUNATICS.

**An Account of all Monies received for Licences by the Clerk and Treasurer of the Metropolitan Commissioners in Lunacy, and of all Monies received and paid out of the Consolidated Fund to the said Clerk, from the 1st August, 1838, to the 1st August, 1839, specifying the several Heads of Expenditure, as required by the Act 2 and 3 Will. IV., c. 107.**

| | RECEIPTS. | £ | s. | d. |
|---|---|---|---|---|
| 1838: October 20..... | To Cash by order from the Treasury, for balance due July 4, 1838..... | 491 | 17 | 8 |
| 1839: January 15 ..... | — Cash by order from the Treasury, for balance due November 7, 1838..... | 630 | 4 | 2 |
| April 13 ..... | — Cash by order from the Treasury, for balance due February 6, 1839..... | 317 | 8 | 0 |
| July 13..... | — Cash by order from the Treasury, for balance due May 1, 1839..... | 509 | 13 | 6 |
| | — Cash received for Licences ..... | 899 | 15 | 0 |
| | Balance due to Commission on this year's account.. | 595 | 4 | 6 |
| | £ | 3,444 | 2 | 10 |

| | DISBURSEMENTS. | £ | s. | d. |
|---|---|---|---|---|
| 1838: July 3..... | By Balance due on last year's account..... | 491 | 17 | 8 |
| 1839: July 2..... | — Clerk and Treasurer, one year's salary..... | 400 | 0 | 0 |
| | — Rent of office, one year..... | 50 | 0 | 0 |
| | — Hire of carriages for visitations, due December 31, 1838..... | 134 | 16 | 0 |
| | — Petty disbursements, postage, and carriage of parcels ..... | 196 | 9 | 2 |
| | — Stamps for Licenses ..... | 20 | 0 | |
| | — Fees to Legal and Medical Commissioners..... | 2,151 | 0 | 0 |
| | £ | 3,444 | 2 | 10 |

Edmund Halswell. | W. R. Farquhar.
—— Seymour. | H. H. Southey.
John Barneby.

We print the above Annual Return by the *Metropolitan Commissioners in Lunacy*. They expend £3000 a-year. This is, no doubt, an important fact. It would be interesting to know what they do for the money. This would be still more important; for it is a curious fact, that they obtain invaluable returns, at considerable expense, and have never contributed a single item to our knowledge of insanity. The paid Commissioners should draw up an Annual Report, and should only receive their salaries when the Report is delivered in. Why pay men who neglect, or half discharge, their duty?

## SOLITARY CONFINEMENT AND THE SILENT SYSTEM.

*To the Editor of* THE LANCET.

SIR:—As I am led to understand that the Government are about to make an experiment upon the solitary confinement and silent system of punishment, in the model prison, which is now being erected, I beg to call your attention to the subject, lest it should be adopted and carried too far, without looking to the effects produced by the same system in other countries where it has been tried for some time, particularly in America and Belgium. From reports published in America we find, that long solitary confinement has the effect of debilitating the mind, as well as the body, and after their time has expired, many criminals are thrown upon the world in a state of complete *idiotcy, besides having contracted habits contrary to nature and prejudicial to health.*

A friend, also, informs me that, in Belgium, murderers are sentenced to solitary confinement for life; and, when he was last there, he inquired how long they generally lived; he was told *only a few years, no matter how young or healthy* previously. He also observed that, in Belgium, those criminals had no work to amuse or employ them. I hope some of your readers, who have had opportunities of making personal observations upon this subject, will take it up, as there can be no doubt but that it may be an excellent mode of punishment, when carried to a certain extent, but beyond that it is highly injurious. I, therefore, consider it would be better for the Government to have that point settled before any rules are put in force, otherwise it will be necessary to be continually tinkering and altering their instructions. Mr. William Wilson, of Upper Charlotte-street, Fitzroy-square, had in his possession, lately, a work of the kind I allude to (published in America), and if he would favour your readers with a few extracts, I think that they would be surprised at the remarkable facts they would unveil. In the report I allude to, there is a great deal of religious feeling and self-laudation on the part of those interested in drawing it up; but there are many startling facts, which, if true, would make the refined cruelty of the silent system appear less humane and merciful than was the Spanish Inquisition. I am yours, most obediently,

WM. SIMPSON.

110, Guilford-street,
May 12, 1840.

## ERYSIPELAS SUCCESSFULLY TREATED WITH SPIRIT OF TURPENTINE.

*To the Editor of* THE LANCET.

SIR:—Knowing how anxious you always are for the promotion of science, and that it is your desire to give publicity to anything that will tend to benefit a suffering fellow-creature, I give you this short account of a case of erysipelas, treated successfully by the administration of the spirit of turpentine. If you deem it worthy of insertion into your very valuable Periodical, you will be conferring a favour on your obedient servant,

A PUPIL IN THE WEST.

S. J., a man of bilio-sanguine temperament, with a deformed chest, applied to me affected with erysipelas of the face, and, from the symptoms, I feared that it had extended to the meninges of the brain. On the following morning I found him in a state of complete delirium, incoherent in his speech, and under restraint. Up to this time he had been bled twice. On the third day he continued to grow worse, and in the evening the comatose stage appeared to have commenced. At this critical moment Dr. Copeland's novel treatment of erysipelas by turpentine, suggested itself to my memory, and I determined to give it a trial. The first dose, ℥ij. was taken in the evening of the third day; and the following morning I found him much improved, and general symptoms amended. By this time about one ounce had been taken, and was beginning to act upon the bowels. In the afternoon of the fourth day, the delirium left him, and he became perfectly conscious; his pulse had fallen from 100 to 86; the swelling, which had obstructed one eye, was greatly diminished, and he is now perfectly well. He took but ℥ij. of the turpentine, and on the fifth morning after my first visit was in a convalescent state. The history of this case would seem to show that this valuable remedy is entitled to a trial, and I have no doubt, that in the course of time, it will become, in the hands of the skilful and unprejudiced, an effectual remedy.

## ULCERATION OF THE TONGUE FROM THE IRRITATION OF CARIOUS TEETH.

*To the Editor of* THE LANCET.

SIR:—The recommendation to examine the teeth in diseases of the tongue, is as old as Celsus, and one that cannot be too strictly observed. The following case, among several which have lately come under my observation, I conceive to be not

unworthy of a place in your valuable Publication:—

M. B., the wife of an agricultural labourer, came to me on the 12th of February last, with extensive ulceration of the right side of the tongue, accompanied with severe inflammation of the neighbouring parts. The right cheek was very much swollen; she could swallow nothing but cold liquids, and experienced great difficulty and pain in doing that. She could scarcely open her mouth to admit of an examination, and complained that her sense of hearing was very much diminished. I asked her how long she had been suffering in this way? When, to my surprise, she said, nearly nine months. I then inquired whether she had had any medical advice? She said she had been to a person, who called himself a doctor, and who promised to cure her in a few days. She brought me some liquid which she had received from this person, who boasts that he is a physician, and that there is no law to prevent him from so acting,—to the disgrace of the Legislature be it confessed.

"I fear," said the poor woman, "that I have a cancer on my tongue, as the *doctor* told me that its obstinacy in resisting his powerful remedies betokened something of the kind; and, I assure you, it makes me very fidgetty."

Her general health was very good; and she had a great craving for food, but could not satisfy her appetite, as the least attempt to masticate gave her excruciating pain. I told her that it was not a constitutional ulcer that had produced all this mischief, but, probably, the remains of a carious tooth, and asked her if any one had ever examined her teeth? She said, no, for she believed they were very good; at least they had not pained her lately. Putting my finger into her mouth, I found, on the same side with the ulcer on the tongue, a sharp projecting fragment of a carious tooth, which I concluded was the cause of all the irritation. I filed it off, touched the ulcer, which was beginning to assume a gangrenous aspect, with caustic, and advised her to take a little aperient medicine, and to gargle her mouth with some honey and water. She improved daily, and at the end of a fortnight was completely cured.

I have met with several cases of this kind, and never neglect to examine, carefully, every part of the dental apparatus in cases of disease of the tongue. What would have been the result had this empiric continued his treatment? Would it not have degenerated into a cancer, or have produced fatal inflammation? I am, Sir, your obedient and humble servant,

J. C. Blewett, M.D., M.R.C.S.

Liskeard, May 18, 1840.

*** The quack above alluded to has infested this neighbourhood for a long time; he was bred a tailor. He is not deficient in natural capacity; but his education and temper, at least the latter, is savage to a degree.

## POTASSA FUSA IN STRICTURES OF THE URETHRA.

*To the Editor of* The Lancet.

Sir:—My late father was in the habit of using the potassa fusa with the greatest success, and I have also, for some years, employed it in my treatment of stricture. I therefore read your report of the proceedings of the Westminster Medical Society with mingled feelings of gratification and pain: gratification, at seeing a mode of treatment, that my father and myself had employed for years, so highly spoken of; pain, at the injury that might result from its unqualified praise; for, after many years' extensive trial of the potassa fusa, I feel bound to say, that it is not an infallible remedy in all cases of stricture. It is this kind of indiscriminate praise that causes many really useful remedies to be one day cried up beyond their value, and on another to be, with equal injustice, decried. I, therefore, sincerely join in Mr. Robins' remark, at the reading of Mr. Wade's paper, and should like to have heard of a few unsuccessful cases; for I am sure, that in a really extensive practice some such cases there must be. I remain, Sir, yours obediently,

F. B. Courtenay, M.R.C.S.L.

# THE LANCET.

*London, Saturday, June 6, 1840.*

The *Report of the Commissioners for Inquiring into Naval and Military Promotion and Retirement*, contains a good deal of information relative to the Medical Officers, and treats of so many topics in which their interests are concerned, that we shall probably have to refer to it at some length on a future occasion. We shall now briefly advert to the evidence of Sir Richard Dobson, the first surgeon of Greenwich Hospital. The Duke of Wellington was in the Chair, and the following questions were put to the witness:—

"2718. From your experience do you consider it advantageous to the naval service that the title and station of physician should be retained in it?—No, I do not think it advantageous to the service.

"2719. Will you be good enough to state your reasons?—Because under that title they are protected or justified in withholding surgical assistance from any person belonging to the service.

"2720. When you state that, can you give any instance wherein, at the hospital or in the navy, a physician has declined to perform, or has not performed, the duties of a surgeon, when he might have done so with advantage to the patient?—No instance can be brought forward in Greenwich Hospital, for the 15 years I have been there, in which either a physician, or a surgeon acting under him as his assistant, has ever used the lancet in any case whatever.

"2721. Do you know any instance where inconvenience has arisen to the service from a physician not thinking it right to use a lancet, or to act as a surgeon?—I have been told at the Admiralty, that the late physician of Haslar Hospital, when the superintendant was threatened so seriously with symptoms of apoplexy that he thought immediate bleeding necessary, himself declined bleeding the patient, and the wife of the superintendant was under the necessity of going herself to find somebody else to do it."

Sir RICHARD DOBSON denounces the exclusive "physician" with the manly spirit and sound sense of a veteran British officer. The case of the *President of the College of Physicians*, who, disdaining the use of the lancet, left his "friend" at the railway station house, dying from apoplexy, and hurried home to feast with the living, is another glaring illustration of the system, and might also have been adduced. Sir HENRY HALFORD'S was, indeed, a civil case, and the President fairly outdid the "late physician of Haslar Hospital," in punctilious etiquette, as well as in humanity. The Navy Physician has a surgical education, and it is the title that undoes him, or, in the emphatic words of the witness, "ties his right hand behind his back."

"2727. How are the physicians appointed? what previous preliminary education do they undergo?—The same as any other surgeons of the navy. They are appointed from the list of surgeons of the navy, but I think it is a misfortune to the service that there is no other promotion for a naval surgeon than that of physician. It would be better if there were promotion without disqualification, so that justice might be done to the individual without injustice to the service.

"2728. Then with reference to the answer you have given, do you think it would be of great advantage to the service, if, instead of calling those gentlemen physicians, they were called surgeons of the fleet?—Most unquestionably, because, after a battle, those gentlemen who are physicians of the fleet will not use any instrument, and never do. There ought to be a surgeon, a man like Sir Astley Cooper, or Sir Benjamin Brodie; then they would perform any difficult operations; but as the thing is at present, a physician to the fleet has his right hand tied behind his back, it being incompatible with his title to operate."

We shall give Sir RICHARD'S answer to the last question, and then offer a remark or two or his proposed remedy for the evil.

"2737. You have recommended a superior rank of surgeon in the service, in preference to the rank of physician. Have you had an opportunity of knowing what are the sentiments of the naval part of the medical profession upon that subject?—It is desirable both because it would give more promotion to surgeons, of whom only two have had any higher rank conferred upon them during the last 26 years, and because it would benefit the service by stimulating to higher surgical acquirement; for without meaning the slightest disrespect to any man on the list of physicians, I can say that if there be any blockheads amongst the surgeons of the navy there is not one who is so great a blockhead as to think himself not perfectly well qualified for the duties of a physician; but when physicians would have the operations of an hospital to perform they would rather feel their disqualification. I am of opinion that a hospital surgeon ought to be higher paid than a physician, inasmuch as his duties are more laborious, and neither less difficult nor requiring inferior qualifications. At all events, if a surgeon blunder, it is seen; a physician may prescribe wrong, but there is no testimony of it."

Sir RICHARD DOBSON proposed that the rank of Physician should be abolished in the Navy, and suggested that the grades should stand thus:—

Superintending Hospital Surgeon.
Assistant Hospital Surgeon, } alike
Surgeon to the Fleet, } in
(instead of *Physician* to the Fleet) } rank.
Surgeon of Ship.
Assistant Surgeon.

On submitting this scheme to the Commission, it was remarked,—

"2730. You are aware that in the army there are, beides the Director-general, eight ranks of medical officers who have different pay and advantages, according to those ranks?—There are; I have a list of them

here. There are six grades in the army above the regimental surgeon. In the navy there is but one, and that is a disqualifying grade; it is that of physician; for if Sir A. Cooper, or Sir B. Brodie, had been in the navy, and promoted as they would have merited, the country would have lost their best,—their surgical services."

Nothing could illustrate better the mischievous effects of the present absurd exclusive distinctions of Surgeon and Physician. What disastrous effects does it not produce, and to what endless confusion of ideas does it not give rise? A man is a Physician, and *therefore* he dares not use the lancet, or perform a simple operation. In the heat of action his "right hand is tied behind his back." Then, on the other hand, what consummate humbug it is to pretend that a man can be a surgeon, unless he be a physician? A surgeon! Why, what is a surgeon? Is he a mere handicraft fellow? A mere mechanic? Is he a butcher, expert in cutting up the body *before death*; or is he a person well versed not only in the structure of the body, but in its functions and its pathology? No one knows better than Sir RICHARD DOBSON that the principal sickness and mortality of a fleet do not arise from the wounds of the men in battle. The Channel-fleet was disabled by fevers and dysentery, by imperfect ventilation, by bad diet, and by flagrant violations of the physiological laws of life. And the efficiency of the navy, latterly, has been increased much more by attention to these physical circumstances than by the progress of operative surgery. Sir RICHARD DOBSON will not maintain that a surgeon, who had passed the mechanical examination in Lincoln's-Inn-Fields, was better qualified to watch over the health of a fleet than Sir GILBERT BLANE.

DUPUYTREN was a physician, and all great surgeons have been physicians. The distinction is abolished in Germany and France, and we hope soon to see it abolished in Great Britain. It would be silly to interfere with the legitimate division of labour; but the examinations must be uniform, and extend to every part of medical science and practice. The title must be uniform; and the medical officer who enters her Majesty's service must be always ready to succour, and to assuage the sufferings and save the lives of, the men who are committed to his charge, either by the operations of surgery, or the appliances of medicine.

The *one Faculty of Medicine* is the sole remedy for the disastrous state of things which the navy witnesses have so justly denounced on this occasion.

In consequence of the evidence of Sir R. DODSON, and of other witnesses, the commission have recommended "that the rank "of physician should be abolished in the "naval service." The Commissioners have recognised the principle of one Faculty, and one Title, in its application to the public services. The Duke of WELLINGTON clearly saw the absurdity of tying a man's right hand behind his back by a title.

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The Resolutions passed at the *Ulster Provincial Meeting of Medical Practitioners*, show that the Dublin Apothecaries' Company, is a fit sister of the Blackfriars Society on this side the water. At the meeting

"Surgeon Shaw, of Killileagh, gave an outline of the treatment he had received from the Apothecaries' Hall. He had been informed against, by some medical men—he was sorry to have to state so degrading a fact; and he saw no alternative, except that of paying the fine. He proceeded, accordingly, to Dublin, about a month ago, and offered to pay the fine, on condition that the Hall would give him an examination. After a good deal of trouble he got the Deputy-Governor to consent to allow him to lay his case, in writing, before a meeting. (Hear.) This he refused to do, and requested a personal interview with the Directors. At length, this was granted to him, and he laid his case fully before them—satisfied them in every thing, except some very trifling particulars, and called their attention strongly to the facts, that he had been 17 years in practice. All was of no avail; the examination was refused, and he was compelled to pay the fine. More than all, the Company would not receive the fine, but referred him to their Attorney, who, again, refused the £20, saying he thought it should be £40, and he had to return and procure a document from the authorities at the Hall, to satisfy him on the point. He considered this treatment most unjust to a man who had

served seven years to a regular apothecary, and possessed every necessary qualification. The secret, however, was, that he had never passed a first examination—such a thing not being considered requisite, when he was studying the business.

The policy or prudence of medical practitioners acting as druggists admits of question. We quite agree with the meeting, that Physicians and Surgeons should be allowed to compound other peoples' prescriptions, if they please; and that the harrassing prosecutions of the Dublin Company should be put a stop to in the present position of the question of Medical Reform. A judicious Medical Reform Bill will obviate these annoyances; and for this reason we shall not refer to the proceedings of the meeting any further than to state the case, very briefly, of our brethren in the north of Ireland.

The Irish Apothecaries' Act passed in 1791; and its professed object was the prevention of the sale of drugs by persons ignorant of pharmacy. The Irish apothecary is the English druggist; or the apothecary in the old sense of the word, and the practice of medicine is not part of his function; but he undergoes an examination, and, in this respect, is favourably distinguished from the English chemist and druggist.

Latterly the Irish druggists (*alias* apothecaries) have encroached extensively on the province of the medical practitioner; they pretend to prescribe, and to direct the application of medicines, as well as to compound prescriptions. They have also revived the dormant powers of the Irish Apothecaries' Act; and attempted an extensive scheme of extortion and oppression, which has very naturally roused a spirit of resistance in the men of Ulster, as the resolutions of the meeting affirm: "in the prosecutions hitherto instituted by "the Apothecaries' Company, regularly "qualified practitioners have invariably "been the objects of attack; while indi-"viduals, possessed of no qualification "whatever, and whose cases come pro-"perly within the province of the Act, but "who, unfortunately for the Hall, have "not had the means of paying the fines, "have as invariably been passed over, to "the continual detriment of the public."

Again, the "Apothecaries' Hall, in direct "violation of the terms of their Act, have, "*on many occasions, sold their license for* 20*l* "*to ignorant persons who had not served an* "*apprenticeship, or otherwise complied with* "*the provisions of the Act.*"

The persons who have been exposed to the galling attacks of the Dublin Company are a numerous body of highly respectable and well-educated practitioners, either graduates of the Universities or of the Colleges of Surgeons. Dr. Hurst, for example, a Member of the Edinburgh College of Surgeons, a Graduate of the Edinburgh University, the recognised Professor of Medical Jurisprudence in the Belfast Institution, and a gentleman enjoying the confidence of a wide circle of his fellow citizens, is threatened with a prosecution by this Dublin viper, that remained in state of a drowsy congelation for nearly 40 years; and now, on the eve of a general measure of Medical Reform, awakens to a writhing life of mischief, and attempts to strike its poisonous fangs into the heel by which it has not yet been crushed.

The Apothecaries' Company, it is said, aim at the realisation of 20,000*l* by their prosecutions. We wish they may get it. The nefarious crusade must be stopped, by a summary measure, if a sense of decency do not induce them to suspend proceedings.

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It may not be useless to state that Mr. Wakley's recently framed Bill is intitled the "Small-pox Prevention Bill," while the Bill from the Lords is called the "Vaccination Extension Bill." "Vaccination *Extinction* Bill" would be a more appropriate designation for the latter measure, as nothing could be better calculated to put a stop to that salutary operation, than its unwise enactments. In drawing up Petitions on this subject, the distinction in the titles of the two Bills should be borne in mind, where the respective measures are not othewise specifically indicated.

## SMALL-POX PREVENTION BILL.

With reference to this Bill, Mr. W. Rayner, of Uxbridge, says, to introduce a Bill into Parliament respecting Vaccination, I have for some years past, as has my father before me, been vaccinating *gratuitously* any poor person who applied to me, coming no matter whence; during the summer, especially, I have often vaccinated 30 or 40 of a morning. In order to keep up the supply of vaccine lymph, and to assure myself of the disease being perfected, I have always requested the persons vaccinated to be brought to me on the day-week after vaccination (and to this I wish, particularly, to call your attention); when, frequently, to my vexation, I have had only *one* or *two* return to be inspected, so that I could not of course tell whether I had been successful or not. The frequency of disappointment led me, before vaccinating any one, to require a deposit of one shilling for each person to be vaccinated, which was returned on the following week when the party came for inspection, and they never failed to come for the shilling. I conceive, therefore, that you must threaten some penalty for not submitting to the subsequent inspection of the vaccinator in a week, or other appointed time, else the vaccinator will not be able to make the proper return, successful or not. I am perfectly convinced that small-pox inoculation can never be prevented unless a severe penalty be enforced to suppress it, for I have repeatedly offered to inoculate *gratuitously with small-pox*, provided the party would allow me to *vaccinate first;* and I have as frequently been refused, while I have as often been offered a fee of 10s. 6d. to inoculate with small-pox, while the party has refused to be *vaccinated for nothing;* such is the stupid prejudice of people, who observe to me, that "they don't like to have the disease of a beast."

A correspondent in Gloucestershire (whose name we withhold because his communication was marked "private,") says, "I have conversed on the subject with one or two medical friends, in whose opinion I have much confidence, and in our opinion the Order ought, likewise, to contain the name and age of the person *from whom* the lymph was taken. Every Order ought, in fact, to be *numbered*, and in that case a reference to the *number* of the Order, belonging to the person from whom the lymph was taken, might suffice; there would thus be afforded a facility for tracing the progress or transit of any particular lymph. The National Vaccine Establishment boasts that it affords an opportunity of tracing the pedigree of every vaccination up to Jenner's lymph. We also think that the *number of vesicles* should be specified in each case, and *the day on which the 'areola' appeared*; also, *the days on which the patient was subsequently seen by the vaccinator*. Probably the Act itself should insist on the patient's being seen on the 7th or 8th day."

Mr. Denham, of Maidstone, proposes the addition of a clause to the Small-pox Prevention Bill, to *compel parents*, who seek gratuitous vaccination for their children, to present them again to the surgeon for inspection. Every gentleman, he adds, "who has practised in the rural districts, knows the difficulty of inducing many parents to take their children a second time to the surgeon, as he directs; and it is a question worthy of consideration, whether some of the reported cases of small-pox after vaccination, are not those in which vaccination has never taken. I am well aware (Mr. Denham continues) that parents, in many instances, can ill afford the loss of time; but as the Bill at present stands, 'Schedule A' will throw all the onus of proof of success, or not, upon the surgeon, who must either ride, perhaps several miles, to obtain it, or, by not filling up the return, will lose his right to be paid the fee. Clause 2, I hope, will not permit respectable tradesmen to obtain gratuitous vaccination. With the proviso suggested, the Bill, without doubt, will be very useful."

Mr. Richard Shillitoe, of Hertford, says, "I hope that every facility will be given to applicants for Vaccination Orders: some overseers will be very shy of giving them. Why not make the gift imperative on application for an order? The necessity of the application being made to an overseer will prevent improper persons, generally, from availing themselves of the privilege. In the 2nd paragraph of your Bill, would it not be better to omit, whenever it shall appear to him that the person on whose account any such order as is hereinafter described, is demanded, has not been vaccinated?' The paragraph would then run, 'Is hereby directed to deliver to any individual applying for the same an order,' &c. Very few persons will apply to be re-vaccinated, at least under common circumstances, and of course the practitioner will not be remunerated if the operation has not been successful."

A "Member of the College and Hall" writes, "In your excellent Bill I do not find any provision for preventing unqualified or incompetent persons from vaccinating. In the immediate neighbourhood where I am practising as general practitioner, lives a chemist and druggist, who, a few months since, fixed over his door, 'Surgeon, &c,' instead of 'Chemist, &c.' In his window is a placard, announcing 'Vaccination Daily,' and in each case he supplies three powders,

for which he charges 6*d*. He is habitually visiting patients at their own homes, and performs the minor operations of surgery, without possessing any legal qualification, or having attended any medical lectures. Only a few years since he was an oil and colourman. The new law should take the vaccination lancet out of his hand, that it may be confined to the pestle and mortar. In the present defective state of the law, no legal proceedings could be instituted against him for vaccinating.

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A Petition from thirty-eight physicians and surgeons of SHEFFIELD and its neighbourhood, on the subject of Vaccination, has been presented to the House of Commons by Mr. WARD, M.P. At the time that this document was prepared the petitioners do not seem to have been aware that more than one Bill relating to Vaccination was before the House. The petitioners represent to the House, that the provisions of the Bill from the Lords "must materially injure the interests of the well-educated part of the medical profession, excite ill-will and discontent among its members, and fail to promote the object which it purports to have in view, namely, to render the system of Vaccination universal." The petitioners object "to placing this important branch of medical practice under the controul and management of a non-medical commission, namely, the Poor-law officers," and say, that the gratuitous vaccination, by "parties appointed by the Poor-Law Guardians in the various parishes, of all persons who are brought to them, without any distinction between those who by law are entitled to receive aid from parochial funds, and those whose pecuniary circumstances render them fully able to pay for medical assistance, will occasion a great increase in the amount of the poor's-rates, and most unfairly lessen the number of patients whom medical practitioners have obtained by their attention and skill, by introducing the parish surgeon into the families and amongst the patients of all other medical men." The petitioners, therefore, pray that the House will not assent to the passing of the said Bill into a law.

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The Medical Practitioners of READING have forwarded petitions for Medical Reform to the Marquis of NORMANBY and Mr. Serjeant TALFOURD, for presentation to the Houses of Lords and Commons. They point out the evil consequences of the want of an adequate legal constitution for the Medical Profession in Great Britain and Ireland. They represent that the existing laws by which medical affairs are regulated, and the institutions which govern the profession, neither guard the public health, nor suppress the pernicious practices of empirics,—to the scandal of a civilised empire. They also complain that the dispensing of medicine, and the sale of poisons, are undertaken by any one, without supervision or controul; and that the corporate medical institutions are wholly unequal to the correction of the manifold abuses which prevail in the profession, or even adequately to enforce the examination of candidates for medical practice. The petitioners, therefore, pray that a sound and efficient legal organization may be conferred upon the medical profession.

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1. *On the Cellular Structure of the Ivory, Enamel, and Pulp of the Teeth.* By A. NASMYTH. Read before the British Association for the Advancement of Science, August, 1839.
2. *Researches Concerning the Structure and Formation of the Teeth of the Squalæ* (?) *with a New Theory of the Development of the Teeth.* By R. OWEN. Read before the Academy of Sciences, Dec. 1839.

THE progress of a country in wealth may be estimated by the increasing number and audacity of its thieves. More money is annually pilfered, in London, than the total revenue of half a dozen German Princes. Is our scientific progress indicated by an analogous tendency to literary depredation? We fear that it is. Our literary thieves are as "Legion," and their audacity truly is "prodigious." One of the few consolations which the laborious student of Nature, in this country, can hold forth to himself, is the pleasure of discussing his favourite topic with those who understand the subject of his pursuit, who sympathise with his zeal, and who urge on his flagging powers to the attainment of a discovery, the only reward for which is, too often, a barren glory. But wo unto him if, like a foolish man in a crowd, he carry his treasure in his coat pocket. Even the station and character of his associates are no guarantees that he will not be unblushingly plundered. The thirst for gain, and an innate tendency to theft, have converted even nobles into swindlers; and analogous propensities have incited many literary persons, respectable in rank and worldly consideration, to the committal of depredations on their scientific brethren of the most disgraceful character.

In the last Number of THE LANCET we

directed public attention to the long-disputed point of Sir Charles Bell's discoveries, and touched briefly, though we trust explicitly, on the "noble" manner in which Mr. Mayo endeavoured to win his game, by "shuffling" the cards to his own advantage. We have now to place before our readers a proceeding which, for the sake of one of the parties in particular, and of science in general, we would fain hope admits of some satisfactory explanation. Under its present aspect, the transaction can only be classed with the plagiarisms of Home and Mayo; nevertheless, we shall simply state the *facts* of the case, and reserve our comments for some future occasion.

On the 29th of August, 1839, Mr. A. Nasmyth read a paper, before the British Association, "on the Cellular Structure of the Ivory, Enamel, and Pulp of the Teeth." In this paper Mr. Nasmyth advanced some very ingenious and *novel* ideas respecting the organic structure of teeth, and their mode of development.

On the 16th of December, 1839, Mr. Owen presented a memoir to the Academy of Sciences, Paris," on the "Structure and Formation of the Teeth in the Squalæ, and on a New Theory of Dentar Development." This theory must have been considered, by Mr. Owen, as one of some importance, otherwise he would not have exported it beyond the seas for presentation to the first scientific body in Europe; yet, as we shall now proceed to show, it is taken, in all the principal points (and without the shadow of an acknowledgment), from the paper of Mr. Nasmyth, which was made public fourteen weeks before, and at the reading of which Mr. Owen himself was, very probably, present. An analysis of Mr. Owen's Memoir was published in the "Comptes Rendus" of the Academy of Sciences (No. 25, 1839); the substance of Mr. Nasmyth's paper may be found in the "Athenæum" (Sept. 14, 1839); the "Literary Gazette" (Sept. 21, 1839), and in the 8th volume of the "Transactions of the British Association." From these sources we derive the following particulars, which seem to justify a charge of very gross plagiarism on the part of Mr. Owen. Not having access to the works of Retzius, Purkinje, Fraenkel, and Schwann, we are not prepared to say how far all the results announced by Mr. Nasmyth are original; but this does not alter the position of Mr. Owen, who has appropriated to himself either the discoveries of Mr. Nasmyth, or the discoveries of others conveyed through Mr. Nasmyth to the scientific public of Great Britain.

Mr. Owen commences his memoir by remarking, "that all recent authors, including Cuvier, De Blainville, and even Müller, have described the teeth as *unorganised* bodies, formed, like the hair and nails, by successive exudations from the external surface of the pulp." (*Comptes Rendus*, l. c. p. 784.)

Mr. Nasmyth, in an early part of his paper, makes a similar remark:—"The interfibrous substance of the teeth, he said, had been improperly described, by modern anatomists, as presenting no traces of peculiar conformation. But his researches had led him to the conviction, that it is not only *organised*, but so differently and characteristically so, in different animals, as to be capable of affording valuable aid to the naturalists in classifying the animal kingdom."—(*Lit. Gaz.*, l. c. p. 601.)

Having noticed the arrangement of the teeth in the uterine fœtus of the white shark, Mr. Owen proceeds to describe the structure of the bulb in the following terms:—

"When we examine the bulb of the tooth before ossification has commenced, we find that it is composed of granules, or semi-opaque cellules, suspended in a transparent *matrix*, and enveloped in a coriaceous, transparent membrane, which constitutes the external surface of the bulb; underneath this membrane the granules, or cellules, are arranged in lines, which correspond exactly with those of the calciferous tubes of the future tooth. The formation of the tooth commences by the deposit of earthy matter in the external membrane of the pulp, but I have not been able to discover the exact arrangement of the calcareous matter in this membrane.—(*C. R.*, l. c., p. 786.)

Every particle of this pretended discovery may be found in the memoir of Mr. Nasmyth. What are the principal facts which Mr. Owen here announces? They are three: 1. The cellular or granular structure of the interior of the pulp. 2. The correspondence between the granules or cells, and the fibres of the ivory (*tubes calcigères de la dent future.*) 3. Deposit of earthy material in the cells, in a manner which he (Mr. O.) was unable to make out. Let us now see what Mr. Nasmyth said respecting all this:

1. "On examining the internal structure

of the pulp, the number of minute cells, presenting themselves in a vesicular form, is very remarkable; they constitute, indeed, the principal portion of its bulk, and are evidently disposed in different layers throughout the body of the pulp. When thin layers of macerated pulp are examined, they present an irregular reticular appearance, and are found to be interspersed with granules." (*Lit. Gaz.*, l. c., p. 397.)

2. So much for the cellular structure of the interior of the pulp. Now, for the second discovery, or the correspondence between the cellules of the pulp, and the calciferous tubes of the tooth (the fibres of the ivory). This, also, had been distinctly announced by Mr. Nasmyth:—

"It appeared to him (Mr. N.) that the frame work of the reticulations, or cellules of the pulp, constitute the fibres of the tooth; at all events, the diameter of the fibres of the reticulations is precisely that of the fibres of the ivory; the points, or projections, rising from the frame work correspond to the centres of the cells, and may be traced to belong to their structure."—(*Lit. Gaz.*, l. c. p. 398.)

Again: "The fibres of the tooth, as it appeared to Mr. Nasmyth, are derived from the frame work of the reticulations; at any rate, the fibres, bounding the reticulations, are precisely analogous, in diameter and direction, to the subsequent fibres of the tooth."—(*Transact. of the Brit. Assoc.*, vol. viii.

3. Mr. Owen informs us—"That the formation of the tooth commences by the deposit of earthy particles in the external membrane of the bulb, and is completed by deposit in its substance, not by a secretion external to it, but that *he was unable to discover the precise arrangement of the salt which is deposited.*"*—(l. c. p. 786-7.) This latter phrase seems borrowed, literally, from Mr. Nasmyth. "The manner in which the osseous matter is deposited in the cells of the interfibrous substance he had not been able to discover," &c. (*Lit. Gaz.* l. c. p. 398); and as to the principle of a dental development being effected by gradual deposit in the substance of the pulp, in contradistinction from the old idea of a secretion from its external surface, nothing can be clearer than Mr. Nasmyth is, upon this point:—"As almost all preceding writers had, he believed, uniformly described the ivory as a secretion from the pulp, he (Mr. Nasmyth) wished, particularly, *to insist upon its being an organic deposition of ossific matter in the pre-existing cells of the pulp.*"

We have here laid before our readers parallel passages from the memoirs of Mr. Owen and Mr. Nasmyth. That of the latter gentleman was published more than three months before the memoir of the former, and *contains every fact which Mr. Owen announced to the Institute of France as his own discovery!* What will our scientific brethren on the other side of the water say to this unfortunate *discovery* of ours? How will M. De Blainville look upon his rival odontographer (*fur* would be a better termination)? We leave these questions for decision to the Academy of Sciences, and to the worthy professor of the "Garden of Plants;" but, in the mean time, we cannot avoid expressing our deep regret, that a man so highly placed in the scientific world as Mr. Owen, should seem to have descended to such unworthy means for the attainment of an ephemeral reputation.

* La formation de la dent commence par le depôt de particules terreuses dans la membrane coriacée externe de la bulbe. Je n'ai pas reussi à saisir l'arrangement distinct du sel qui se depose dans cette membrane.

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## ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

*Tuesday, May* 26, 1840.

Sir B. C. BRODIE, Bart., President.

*Case of Aneurism of the Arteria Innominata, in which the Carotid and Subclavian Arteries were tied.* By W. WICKHAM, Esq., *Surgeon to the Winchester Hospital.*

THE patient was a tall, spare man, of sallow complexion, 55 years of age, and had followed the occupation of a sailor. He was admitted into the hospital in September, 1839, with a swelling over the right clavicle, about the size of a hen's egg, and having all the characters of aneurism of the arteria innominata. The tumour extended over the carotid artery at its lower part, reaching as high as the omo-hyoideus muscle, and also reached outwards over the subclavian artery. As it appeared impossible to place a ligature on the affected artery with success, the author, in consultation with his colleagues and Sir Astley Cooper, determined on tying the carotid and subclavian arteries. In pursuance of this resolution, the carotid was tied on the 25th of September, 1839, without any unusual circumstances. Immediately on the ligature being tightened, the sac was evidently reduced in size, and the force of the pulsation in the tumour diminished. The cough and dyspnœa,

which had been prominent symptoms in the case, were also greatly and immediately relieved. At the end of three weeks the patient quitted the hospital, contrary to advice, and promised to return in a week or ten days. The tumour, at this time, was of the diminished size, to which it had been reduced at the time of the operation. Unfortunately, however, the man did not return until compelled to do so by dyspnœa, the consequence of the rapid increase of the tumour to more than double its original size. On the 3rd of December it was determined to tie the subclavian artery, notwithstanding that the patient appeared to be almost at his last gasp from suffocation, so that great fears were entertained lest he should die under the operation. As soon as the artery was tied, the dyspnœa was so much relieved, that the man walked to his bed with ease, and from that time until he died, he continued free from any inconvenient pressure on the trachea. Four days after the operation he was seized suddenly with delirium, which, however, was soon relieved: from this time, the tumour slowly increased; but he recovered his strength sufficiently to wish to leave the hospital. On the 5th of February, the ligature having previously come away, he left the hospital, and lived until the 16th of that month, when he died from hæmorrhage, consequent upon the bursting of the sac. Dissection showed the disease to have been seated, as was supposed, in the arteria innominata. A preparation of the diseased parts was shown to the Society.

A discussion of considerable length, of a desultory character, and involving a number of questions, took place. It would scarcely be possible to give a report of the proceedings in detail.

The first question to be decided was the nature of the arterial cyst, for the cure of which the operation had been performed. It appeared from the answers of Mr. Wickham, that the sac of the aneurism was perfectly healthy, containing no coagulum, and depending simply on dilatation of all the coats of the vessel. Mr. Wickham, however, subsequently remarked, that owing to the hurry with which the post mortem examination was necessarily conducted, he was unable to examine the inner coat of the sac accurately, and, therefore, could not determine positively whether there existed any lesion of it or not. The blood in the cavity, however, was fluid.

Sir B. Brodie examined the preparation sent round, and came to the opinion that the disease consisted of simple dilatation of all the coats of the artery, and that there was no lesion of the inner coat. He remarked, that it was not usual for coagulation of the blood to occur in cavities so formed, nor for any deposit to take place on the inner coat, where it was entire.

Mr. Arnott had never seen an aneurismal tumour of the size of the one under discussion, in which the internal coat was entire. He did not perfectly agree with Sir B. Brodie in the result of his examination of the preparation before the Society. He believed there was a preparation of aneurism in the museum of the College of Surgeons, in which there was a deposit on the internal coat, although all the tunics of the artery were entire.

The next question had relation to the cause of the failure of the operation in Mr. Wickham's case, and was prefaced by an inquiry from Mr. Arnott, as to the condition of the anastomosing vessels between the ligature and the aneurismal sac. Mr. Wickham, however, was unable to answer the question, from the cause he had before alluded to.

Mr. Arnott regretted his question could not be answered, because he considered that it was likely that coagulation failed to occur, in consequence of the anastomosing vessels between the ligature of the subclavian, and the sac having remained pervious, and thus keeping up the circulation through the tumour. Unless it were possible that ligatures could have been placed on all these anastomosing branches, he believed the operation could not have succeeded in producing coagulation in the tumour.

Mr. Bransby Cooper attributed the failure of the operation, in the case under discussion, to the fact of the coats of the vessel being simply dilated, and the internal coat remaining entire. So long as the internal coat of such a cavity maintained its integrity, coagulation did not take place; and so long as the blood in the dilated part of the vessel remained fluid, he could not conceive how it was possible that a ligature, placed upon the distal side of it, could produce coagulation. There might be an accumulation in the sac, but no formation of coagula.

Mr. Wickham observed, that the remarks which had been made had reference, chiefly, to the case under discussion not having been a favourable one for the performance of the operation. The result of this case, however, did not determine us in coming to the conclusion that the operation of tying the vessel on the distal side of an aneurism never might succeed. In this case, even, much languor of the circulation was induced by the operation; and had the case been a more favourable one, coagulation might have taken place. With regard to the question of determining the condition of the contents of a dilated artery, he could only observe that it was a difficult one.

Dr. Addison did not agree with the last observation. He considered there were many differences to be detected between a tumour containing fluid blood and one con-

taining coagula. The age of the patient; his occupation, and the presence or absence of disease of the aortic valves, would clear up much of the difficulty in the inquiry.

Dr. Mayo now broached another point of discussion, by inquiring whether the temporary relief afforded in Mr. Wickham's case, might not have resulted from the shock given to the nervous system by the operations, or from the loss of blood which necessarily ensued. He also made some remarks with the view of showing the importance of employing all the general modes of treating aneurisms of this character, before resorting to the surgical one of placing a ligature around the vessel.

These observations gave rise to many others on the same subject, having the same tendency.

Mr. Perry related a case which had been under the care of the late Mr. Earle, in St. Bartholomew's Hospital. In this case, which was one of aneurism of the arteria innominata, the disease was cured by repeated venesections and starvation.

Mr. Lloyd made some observations with the view of showing that the treatment of aneurisms by bloodletting was not carried to the extent which was required, and that venesection should be much more frequently resorted to than was now the practice.

Mr. Erasmus Wilson remarked, that the author of the paper had stated, that the tumour of the aneurism was so large as to compress the trachea and surrounding parts, and give rise to dyspnœa, and threatening suffocation; but that immediately the carotid and subclavian artery were tied upon the distal side of the aneurism, the tumour diminished in size, and the distressing symptoms ceased. Now, he (Mr. Wilson) wished to learn the cause of this so sudden diminution in the bulk of the aneurism. Two causes had been suggested by Dr. Mayo: 1st, the loss of blood during the operation; 2nd, the impression made upon the nervous system. Mr. Cooper, on the other hand, appeared to consider that the ligature of these two arteries ought to have the contrary effect, viz., of increasing the distension of the aneurismal sac. But the fact that the sac had actually been diminished was before the meeting, and had not been questioned, nor, indeed, could it be doubted. Mr. Wilson would suggest, as an explanation of this interesting practical fact, that so long as a current was permitted through the sac, by the existence of the two channels of escape, the carotid and subclavian artery, the pressure of the moving column of blood would be very considerable; but that when those two channels of escape were obstructed by ligature, the pressure of the motionless blood, acting equally on all sides, would oppose the entrance of more blood from the aorta into the sac, while, from the same cause, the pressure of distention would be diminished, and permit of the contraction of the parietes of the sac. He offered this suggestion rather from a wish to hear the opinions of those better qualified to decide the question than to obtrude upon the Society any views of his own.

Mr. Wickham remarked, that in his case, not two ounces of blood were lost in either of the operations, and instead of depression of the nervous system following, there was, in fact, a great accession of strength. The breathing was also materially relieved, and the tumour diminished to half its size.

After some further observations from other members, the Society adjourned.

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### HYDATID IN THE LIVER.

At a meeting of the Society on the 12th of May, a case was read by Mr. Curling, of the London Hospital, of a rare species of hydatid (the echinococcus hominis) having been found in the human liver.

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## PATHOLOGICAL MEETING.

*Tuesday, June 2, 1840.*

### POLYPUS OF THE HEART.

Dr. Boyd exhibited a preparation of a very large polypus of the heart. The patient from whom it was taken was a man, 73 years of age, who sunk from diarrhœa. About a fortnight before his death he was admitted into the St. Marylebone Infirmary. He was then in a state of great exhaustion, and for two or three days previous to dissolution his pulse could scarcely be detected. He had, also, paralysis of the right side. After death, a tumour was found in the left hemisphere of the brain. On examining the heart, it was found to be hypertrophied; in the left auricle, attached to the septum, was a large polypus, which was covered by a membrane continuous with the endocardium. There was no solution of continuity of the membrane in any part. The polypus was about the size of a small walnut. The heart was injected by the coronary artery. On cutting into the polypus, the upper portion was found to consist of coagulated blood, which still retained a portion of its colouring matter. The lower part of the growth consisted of fibrine, which, under the field of the microscope was found to be of a granular structure. Several vessels permeating the polypus, and passing through it in several directions, were visible; there was also a quantity of extravasated injection in the centre of the diseased growth, probably resulting from the rupture of a vessel during the process of injecting it.

In another preparation, belonging to Mr. Kiernan, and which Dr. Boyd exhibited, in connection with his own, a coagulated clot

was found in the common iliac vein, and a vessel was detected passing into it.

Dr. CLENDINNING had never seen so large a polypus of the heart as the one exhibited by Dr. Boyd. The subject of these formations was one of much interest, and involved inquiries connected with phlebitis and phlegmasia dolens.

Mr. ARNOTT recollected a case in the Middlesex Hospital, some years since, in which a polypus of the same form, but somewhat larger than the one now exhibited, was found in one of the auricles. This tumour was also covered with a fine membrane continuous with the endocardium.

Dr. C. J. B. WILLIAMS thought that the first specimen, exhibited by Dr. Boyd, was not one of the usual kind of polypi of the heart, such, for instance, as were found embracing the chord tendineæ. Its external aspect resembled much more those warty formations which were attached to the valves. These excrescences were generally rough, and had no membrane over them. He had, however, seen them contain colouring matter besides fibrine, as was exhibited in this instance. The polypus in Dr. Boyd's case resembled those formations in other parts of the body more than it did the proper polypi of the heart. With regard to the question as to whether polypi of the heart were formed previous to death or not, he had in some cases observed, that where the polypus had encased one or more of the chordæ tendineæ, the aperture through which they passed, was much larger than was necessary for their passage; a fact which he accounted for by supposing it to be the result of the motions of the heart during life.

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CARTILAGINOUS FORMATION IN THE SPLEEN.

Dr. CLENDINNING exhibited a portion of the spleen, with a large cartilaginous formation, under the external tunic of the organ.

The formation in question was about an inch broad, four inches in length, and about as thick as a penny piece. He brought the specimen before the Society chiefly with the view of stating his opinion with regard to the mode of its production. Having found formations of a similar character, though not often to the same extent, in the spleen, liver, kidneys, and heart of old people, the degree and extent of the formation bearing relation to the age of the patient, and without the presence of any symptoms of inflammation, he had come to the conclusion that they were the result of a peculiar modification of nutrition, dependant upon age, and were not always the product of inflammation, as supposed by Broussais and his followers. With reference to the white spots found on the heart, he had seen the table of Mr. Paget on this subject, and differed from him in supposing them always to be the result of an inflammatory process. Of course he did not deny that there might be such changes produced by inflammation; but he considered that when they did result from this cause they were external to the lining membrane; when beneath the endocardium, he believed they were dependant upon a modification of nutrition connected with age.

Dr. WILLIAMS agreed with Dr. Clendinning as to the cause of the formation in the case exhibited; in this the cartilaginous deposit was under the fibrous capsule of the organ. He differed with him, however, with reference to the mode of formation of the white spots found on the surface of the pericardium, which he thought, from having observed them so frequently, in connection with other signs and symptoms of inflammation, to be the result of that process. He did not think, with Dr. Clendinning, that the fact of these patches being, in some cases, situated under the serous coat, was a proof that they were not inflammatory. The pericardium consisted of a serous and fibrous layer, and these spots might be the result of inflammation of the latter.

Mr. SHAW recollected a case which might throw some light on the subject under discussion. During last session, while demonstrating the heart of a young person about 10 or 12 years of age, who had perished from an accident, he found, on opening the pericardium, at that part of it where the white spots are usually situated, a portion of the membrane which exhibited an increased state of vascularity, evidenced by much redness, and an obvious degree of softness in the part; the softened part was surrounded by a zone of vessels. The inflammation was different from that usually found in pericarditis. There was no adhesion of the membrane, but the natural structure was so much destroyed that he could not say whether the vascularity was above or beneath the pericardium, but he considered it situated in that membrane itself.

Mr. CHARLES HAWKINS had, some years since, examined the body of a patient in St. George's Hospital, who had died of some chest affection, and on opening the peritoneal sac, a fibro-cartilaginous formation of the size, and very similar in appearance, to a hen's egg, was discovered in the right iliac fossa. On cutting open this tumour, which was quite unattached, it was found to consist of a number of layers of fibro-cartilaginous deposit, surrounding a nucleus of calcareous matter, about the size of a pea. There had been no symptoms during life to indicate the presence of such a tumour.

Dr. WILLIAMS recollected this case; the patient was a man. Andral considered that these tumours were originally attached, to some part of the peritoneum, by a slender neck, that this became atrophied, and the connection was destroyed.

Dr. CLENDINNING considered these formations were analogous to those occasionally found in the joints. He had seen smaller ones of a similar character, connected by long ligamentous attachments to the valves of the heart.

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UNUNITED FRACTURE OF THE TIBIA.

Mr. ARNOTT exhibited the tibia and fibula of a patient whose leg had been amputated in consequence of an ununited fracture of the former bone. The history of the case was as follows:—The patient, a man, had been in one of the hospitals in April last year, labouring under the symptoms of secondary syphilis; he had a node on the right shin, an eruption on the skin, and ulceration of the throat. He took mercury, and, with the exception of the node, soon got well, and left the hospital. About a week afterwards he slipped down in the street and fractured his right leg in the situation of the node. He was brought into the Middlesex Hospital, and came under Mr. Arnott's care. His general health was very bad. On examining the injured limb, the fracture was found to be across the node, and very oblique in its direction. There were some ragged points of bone situated over the node; these produced great irritation and spasm, and the fracture, previously a simple one, became, in consequence, compound. The case was one difficult to treat; mercury was avoided, for fear the adhesive process might be interfered with, and iodide of potassa and sarsaparilla administered. The node was soon absorbed, but no union of the tibia took place. This plan of proceeding was followed from June to September; his general health remaining in a wretched condition. The bichloride of mercury, with sarsaparilla, was now administered, and his health rapidly improved. The fracture remained in *statu quo*. The limb was now placed in splints, and bound up; no good results followed. Blisters were placed round the affected part, but without benefit.

Tonics were again administered, and then mercury, which has occasionally been found useful in procuring union of ununited bones. All these means failed. It was now thought that a fragment of bone might have got between the divided portions of the tibia, and have prevented the process of reparation. The soft parts were freely divided, and the bone examined; no fragment was detected, but the fractured extremities were found to be carious. Erysipelas followed. At the end of ten months and a half from the receipt of the injury, amputation of the leg was resorted to. The case illustrated two points of interest: it showed that the cause of the non-union of the fractured bone was not a constitutional one, for the fibula was firmly united; but that it depended upon the local mischief which had been produced. The carious extremities of the fractured tibia, at its posterior part, had become slightly united.

Mr. CHARLES HAWKINS inquired whether Mr. Arnott had ever seen mercury of service in cases of ununited fracture. In three cases which had come under his (Mr. Hawkin's) observation, mercury was freely administered, but without benefit.

Mr. ARNOTT had not seen mercury of benefit in these cases. In one other case besides that related, he had tried it without success. Mr. Colles, of Dublin, had, however, found its use of great benefit in some of these cases, and one instance had occurred in London, during the last winter, in which it was completely successful.

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## THE SMALL-POX AND VACCINATION BILLS.

PETITION FROM NOTTINGHAM.

*To the Editor of* THE LANCET.

SIR:—The Committee of the British Branch Medical Association for the Nottingham District, direct me to acquaint you that a petition has to day been forwarded to Sir R. C. Ferguson, M.P., for presentation to the House of Commons, against that most iniquitous and degrading measure of Sir James Graham, relating to the placing vaccination under the Poor-Law Commissioners. They hope that you will give your strenuous support to the petition, which sanctions the Bill proposed by yourself. The petitions will be forwarded next week; but the shortness of the time has prevented more efforts being made to thwart a measure which is calculated to injure the profession and the public. I am, Sir, your obedient servant,

H. C. ATTERBURROW, Hon. Sec.

Nottingham, May 22, 1840.

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## REMARKS AND SUGGESTIONS ON THE VACCINATION AND ANTI-SMALL-POX BILLS.

*To the Editor of* THE LANCET.

SIR:—As it is highly important at the present moment that correct views should be entertained with regard to the intended Vaccination Bill, I beg to occupy your attention for a short space on the subject of the returns to be required of vaccination, as vaccination ought, and I trust will, in a legislative measure, be viewed with a regard to the interests of science, as well as of the individual members of the community; it is a point of consequence that the returns

should be so complete, without tediousness, as to afford sufficient materials for scientific inquiries to illustrate the several statistical questions yet unsolved. A little examination would, I think, show that no form of report, hitherto proposed, offers this desideratum in an adequate degree. I endeavoured to show, in my last communication, the inadequacy of the return proposed in Lord Ellenborough's Bill, and I must think that the form proposed in THE LANCET of May 9, is still insufficient. The following is the form which I have long adopted, and which, although it may probably be improved upon, yet seems to me to combine most of the points required :—

| No. | Date of Vaccination. | Name and Residence of Person vaccinated. Rank or Occupation of the Parents. | Age. | How often Vaccinated. | Number of Punctures. | Progress of Vesicle. | From whom Vaccinated. | State of Health. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| 800 | 1838 Aug. 15. | Strudwicke, Samuel, Orchard-street. Brother to 802. —— Labourer. | 4 Months. | 1 | 3 | 8th day vesicles rose very fine. | 797 | Healthy. | |
| 803 | 1838 Aug. 22. | Cooper, Martha. Sister to 391. —— Grocer. | 9 Weeks. | 1 | 4 | 8th day, vesicles very good. | 855 | Delicate scrofulous child. | The vesicles itched very much, and on the 9th day were broken by scratching. |

In connection with the name of the patient, I put the fact of relationship with any previously vaccinated by me; by this means I keep the vaccine history of whole families in connection, a point of interest and value in many points of the inquiry, illustrating both hereditary and correlational aptitude, or inaptitude for the reception of the vaccine. This, and other parts of the report, are rendered more concise, and more easy to be kept, by numbering every case. The column for the number of times vaccinated, has its value in connection with re-vaccination, as often as it may be repeated. The column for the number of punctures will be interesting, with regard to the *intensity* of the vaccine power. I only report my cases on the 8th day; but it would be very desirable to have at least two reports of the progress of vesication. The statement, from whom vaccinated, is important in many points of view, and by the mere insertion of the number of the cases enables us to trace back the history of the virus we are using, thus enabling us often to account for anomalies in its course, which, without such help, we could not do. In my own column for remarks I have given much more proportionate room than in this copy, as important facts may often here require to be recorded.

I have not explained, at large, the several points of importance which would receive elucidation from a well-arranged form for the report. A little reflection will readily suggest most of them; but I must repeat my conviction, that a more complete return than any that has hitherto been offered, is essential to the efficient working of the Act, with a proper regard to the interests of medical science. I am, Sir, your obedient servant,

A. T. S. DODD.

Chichester, May 19, 1840.

## NON-MEDICAL CORONERS.

ON Thursday a young man, named Thomas Shepherd, was charged before John Bairstow, Esq., with killing and slaying a person named Rose. It appeared that about half-past seven o'clock on the preceding evening the accused and deceased had been fighting, but were disturbed in consequence of the police being sent for. They then separated, and went away in different directions, neither of them giving any intimation of an intention to renew the fight. About nine o'clock, however, the accused person, Shepherd, went to the Woolpack, where he found the deceased sitting and drinking. Some words took place, on which the prisoner struck the deceased, and a violent scuffle then ensued. In a few minutes they both fell together on the floor, the accused being uppermost. While in that position the prisoner, it was stated, struck the deceased several blows, which, in a very few minutes, appeared to have done him severe injury; for after being picked from the floor, he shortly afterwards expired. The deceased was 29 years of age.

The inquest on the body was held at the Town Hall, before Mr. Palmer, Coroner, and a respectable jury.

Robert Norris, weaver, examined.—On Wednesday night last, about half-past ten o'clock, I went to look for Rose, at the Woolpack; I saw him lying on his back, about a yard, or a yard and a half from the door. Rose knew me, called me by name, and said, "Bob, is that thee?" I said, "Aye;" he replied, "I am a done man, I am done, I am done." I asked him if he knew any one that had done it? he said, "aye, it is Shepherd that has done my job."

I tried to lift him up; he complained of the back of his neck; I asked if he was hurt anywhere else? he said betwixt his shoulders. He died a quarter before three o'clock on Thursday morning last.

Mr. Booth, surgeon, examined.—In consequence of a request from the coroner, this morning, I made a post-mortem examination of the body of John Rose. There were no external marks of injury done to the body, except a slight scratch on the right collar bone, a slight contusion on the outer part of the right cheek bone, one above the left eye, and several bruises about the head. On dividing the scalp, I found a considerable quantity of extravasated blood between the scalp and the skull. I then opened the skull and found the vessels of the brain waded (? loaded) to a very great extent. The deceased died from apoplexy, which might be produced by a blow, or a fall, or excitement. I think the external bruises on the head were not sufficient to produce apoplexy: judging from appearances, I think apoplexy was not brought on by a fall, but, probably, by excitement.

The jury, after a short consultation, pronounced the following verdict:—"Died by apoplexy; but how produced, no satisfactory evidence has been produced before the jury." The prisoner was immediately liberated.—*Preston Chronicle*, May 9.

## POISONING BY LAUDANUM

SYNONYMOUS WITH

## ACCIDENTAL DEATH.

On Thursday last an inquiry took place at the Town-hall, before Richard Palmer, Esq., coroner, and a respectable jury, touching the death of an infant of about a week old, named Ellen Anderson, who was stated to have died in consequence of a dose of opium, injudiciously and imprudently administered to it by Richard Worsley, a weaver, and an empirical practitioner in medicine.

Mr. Wm. Howitt, surgeon, examined.—I yesterday made a post-mortem examination of the body of the deceased. The surface of the brain was considerably congested with blood, and there was fluid in the ventricles of the brain; the lungs and heart were natural; the blood throughout the body was in a state of fluidity; the bowels were healthy; the stomach was healthy, except the inner coat, which was softened. The whole surface of the body presented an exceedingly livid appearance. I have analysed the contents of the stomach, and of the bottle from which it is alleged the fluid was given. I have no hesitation in saying that death was caused by the administration of the solution of opium.

Ann Anderton examined.—I am the mother of the deceased; it was born a healthy child, and remained well until Monday night last; it did not sleep all Monday night. On Tuesday morning Richard Worsley came into the house, and asked how the child was. I told him it was restless, and he said he could give me some stuff to ease its bowels, and help it to rest. He then fetched some medicine in a bottle. He told me to give the child a teaspoonful in a little tea. Shortly afterwards, it fell asleep, and was put to bed; it slept until between four and five o'clock, and becoming alarmed, I told Ellen to fetch the child down, and it appeared to be in a fit; it continued in that way until we thought it was dead, but it recovered again. About seven o'clock I again sent for Worsley; he came soon after, and said I was not to be alarmed; it was not the stuff the child had taken, but convulsive fits; he then went away, and the child continued the same. Worsley afterwards came in again, and I told him he had murdered my child with laudanum; he said, "No, no, it is not my stuff, it is convulsive fits; I don't care who examines the bottle." I have known Worsley for about a month; I had heard that he had done children good. I did not send for Worsley before the child was in fits.

The learned coroner carefully stated the case to the jury, who, after a short consultation, returned a verdict of "Accidental Death."—*Abridged from the Preston Chron.*

## TO CORRESPONDENTS.

*Mr. Courtenay* will observe that the greater part of the remarks contained in his communication are rendered unnecessary by the letter of Mr. Wade, in THE LANCET for May 16; we have, therefore, inserted only that part which relates to the merit of the potassa fusa in strictures.

COMMUNICATIONS have been received from *Mr. Curtis, A Tradesman, An Old Physician.*

*Mr. Reid.*—A paper has latterly appeared on the statistics of cholera by Dr. Greaves; an abstract of the most important facts which it contains shall shortly appear in THE LANCET.

*Mr. Mackmurdo's* communication is an advertisement. We have received similar notices from several of the Schools, but Mr. M. will observe that none have been inserted.

ERRATA.—In our last Number in Mr. Yearsley's letter, line 12, for "flexible," read *inflexible;* line 13 and 39, for "cathether," read *catheter;* line 21, for "subsegnent," read *subsequent;* line 29, for "affectation," read *affection;* line 30, for "primâ facia," read *primâ facie;* line 37, for "narim," read *narium.*